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NOTICES:—All communications relating to editorial matter should be addressed to the Editor, who will be pleased to consider articles or contributions dealing with modern chemical developments or suggestions bearing upon the advancement of the chemical industry in this country. Communications relating to advertisements or general matters should be addressed to the Manager.

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A Return of Chemists' Salaries

THE periodical return of salaries that the Institute of Chemistry obtains from its members is not, of course, entirely representative of the whole profession, but it is valuable in that it represents much the most important professional association, and is very carefully organised and checked. In connection with the latest Institute census of salaries, published in the Journal for June, 3,828 cards were received—1,084 from Fellows resident in the British Isles; 2,218 from Associates similarly resident; 210 from Fellows abroad; and 308 from Associates abroad. The total number of members who returned cards indicating that they were unemployed was 96. The number out of the entire Institute membership of 5,800 known to be unemployed in December, 1930, was 110, and at present is 124.

The returns show the standard of remuneration to be higher than is generally supposed, though it must be remembered that the Institute represents a high standard of qualification. Taking the 940 returns included from Fellows resident in the British Isles, we find that only 7 receive less than £250 a year (0·7 per cent. of the total membership); 161 receive between £250 and £500 (17·1 per cent.), 439 receive between £500 and £1,000 (46·7 per cent.), 141 receive between £1,000 and £1,500 (15 per cent.), while 192 (20·5 per cent.), including employers and persons in private practice, receive over £1,500. Of the senior members of the Institute, therefore, only 17·8 per cent. are below the £500 standard, while 61·7 per cent. are between £500 and £1,500, and no less than 20·5 per cent. above £1,500.

Taking the junior branch of the Institute, the Associates, 2,131 returns from whom are included, the salary standards are naturally lower. Associates receiving less than £250 number 171 (8 per cent.), between £250 and £500, 1,321 (62 per cent.); between £500 and £1,000, 524 (24·6 per cent.); between £1,000 and £1,500, 65 (3·1 per cent.); and over £1,500, 50 (2·3 per cent.). The largest section is, as we should expect, between £250 and £500 (62 per cent.), but a proportion of 24·6 per cent. between £500 and £1,000 cannot be considered unsatisfactory.

Of the 193 Fellows resident abroad, 2·1 per cent. are below £500, 35·7 per cent. between £500 and £1,000, 28·5 per cent. between £1,000 and £1,500, and 33·7 per cent. over £1,500. Of the 301 Associates abroad, 3 per cent. are below £250, 23·9 per cent. between £250 and £500, 54·1 per cent. between £500 and £1,000, 13 per cent. between £1,000 and £1,500, and 6 per cent. above the latter figure. It is made clear by these figures that the higher salaried groups abroad are appreciably larger than among members employed at home. The Institute deserves thanks for carrying out these troublesome inquiries and in setting out the results for public information in so clear and detailed a fashion.

A Great Victorian

THE late Sir Hugh Bell, one of the finest survivors of the Victorian school, included in the wide range of his industrial interests a personal as well as family association with the heavy chemical industry. Both of his grandfathers were men of scientific and commercial distinction. One of them, Hugh Lee Pattinson, revolutionised the lead industry by the invention of a new and cheaper process of de-silverisation. The other, Thomas Bell, was attracted to the Tyne by a merchant adventurer named Losh, who laid the foundations of the alkali trade on Tyneside, which flourished up to the introduction of the ammonia-soda process by Brunner, Mond and Co. A few years later, Isaac Lowthian Bell, the father of Sir Hugh Bell, joined his father-in-law and two brothers-in-law in founding the Washington Chemical Works, which he carried on until the early 'seventies, when he also became interested in the iron and coal trade.

Sir Hugh Bell, at the age of 15, was sent to Paris, where he studied chemistry at the Sorbonne under

St. Clair Deville; later he went to Göttingen, where he had for his instructors Deville's brilliant collaborator, Vohler, who has been described as the founder of modern organic chemistry, and Stein, a mathematician scarcely less famous. Early in his business career he removed to Billingham-on-Tees to direct the Port Clarence Iron Works, and thus became closely connected with the great chemical developments in that district. He was for many years a director of the firm of Brunner, Mond and Co., which, with a view to facilitating the export of alkali and soda crystals to the Continent, desired to acquire a footing on the Tees. To this end they acquired the soda works of Bell Brothers and purchased an interest in the salt mines, Sir Hugh Bell joining the directorate in 1893.

The Work of the Public Analyst

THE annual report of the City analyst of Birmingham for 1930, of which a copy has just reached us, is an excellent illustration of the valuable work done in the protection of the public against impurities and deficient quality in their food. During the year Mr. H. H. Bagnall and his staff have analysed 5,742 samples of food, and it is a testimony to the efficiency of this valuable public service that the defects are not more serious than they are. The work, moreover, appears to be done in the proper spirit. Unless the adulteration or misdescription of an article is obviously deliberate and, therefore, admits of no excuse, prosecution is not resorted to unless all other methods fail. Experience goes to prove that generally offences or mistakes can be very much better dealt with by negotiation than by taking legal proceedings. The great majority of manufacturers are found to be quite willing to fall in with any reasonable suggestion for the improvement of the quality of their goods or for their clearer and more honest labelling.

There has been, Mr. Bagnall reminds us, no change during 1930 in the law relating to food and drugs, although proposals have been made respecting the proper labelling of cheese and the fixing of the fat content of cream cheese at not less than 80 per cent. of fat on the dry solids. The latter suggestions are described as steps in the right direction which would enable the purchaser to make sure that so far as the fat content is concerned the purchaser is getting what he asks for. It is very unsatisfactory, in Mr. Bagnall's opinion, that no attempt has been made to introduce legislation dealing with food labels and standards. He refers quite frankly to the "unscrupulous and misleading way in which certain goods are advertised," and holds that "the ideal Food and Drugs Act would give the purchaser a very good chance of knowing precisely what he is buying and would do away with the present system used by some manufacturers of describing all their goods, whether cheap or dear, good or bad, by means of superlatives." It does, as the Birmingham City analyst points out, seem remarkable that, while the United States, Canada, New Zealand, South Africa, and other countries have Acts that enable standards to be fixed for foods and drugs, this country should be still content to govern our procedure by an Act which is now fifty-five years old and quite out of date. Examples of the unsatisfactory state of things in the jam and milk trades are given in detail. The education of the public as to the need of stricter standards is a slow business, though the public are the direct sufferers, and these carefully prepared reports by our municipal analysts are valuable educational agents.

Although some of the examples of adulteration in British reports are surprising, they are mild compared with the examples that come from the United States. The U.S. Department of Agriculture regularly issues "Notices of Judgment under the Food and Drugs Act," and many of these are entertaining, though not always appetising. For example, in the latest publication to reach us, there is a beet pulp adulteration case, in which a shipment of beet pulp contained "wood splinters, string, paper, pieces of metal, bent nails and a material resembling red lead," which, it is mildly remarked, would render it dangerous if fed to cattle. Greek string figs in one case are described as "wormy or worm-eaten, moldy or smutty, sour and dirty," and in another as "filthy, moldy, wormy, or decomposed," which is certainly not a good advertisement of Greek string figs as a table delicacy. Walnuts might be thought by their shells to be more or less protected, but one sample is described as "wormy, moldy, rancid, decomposed, shriveled, and empty." In the American practice, these cases are officially printed and circulated, with the names of the parties, and the publicity given to them is probably a worse penalty even than forfeiture and destruction.

Books Received

ARTIFICIAL RESINS. By Johannes Scheiber and Kurt Sändig. Translated by Ernest Fyleman. London: Sir Isaac Pitman and Sons, Ltd. Pp. 447. 30s.

THE SULPHUR COMPOUNDS IN WATER-GAS AND THEIR REMOVAL. Fuel Research Technical Paper No. 31. Pp. 36. 9d.

THE ACTION OF HYDROGEN UPON COAL—I. By A. Crawford, F. A. Williams, J. G. King, and F. S. Sinnatt. (Department of Scientific and Industrial Research, Fuel Research Technical Paper, No. 29.) London: H.M. Stationery Office. Pp. 37. 1s. 3d. net.

THE SOAP MAKERS' DIRECTORY, 1931. London: Simpkin, Marshall Ltd. Pp. 84. 2s. 6d. net.

UNIVERSITY OF BIRMINGHAM. REPORT ON THE WORK OF THE MINING RESEARCH LABORATORY DURING THE YEAR 1930. Birmingham: D. McMichael. Pp. 20.

The Calendar

July 13	SOCIETY OF CHEMICAL INDUSTRY JUBILEE CELEBRATIONS: Chemical Plant and Research Instruments Exhibition: Opening 11.30 a.m.	Central Hall, Westminster, London.
14	Annual General Meeting. Presidential Address by Sir Harry McGowan. 10.30 a.m.	Royal Academy of Music, Marylebone, London.
14	"Recent Developments of the Society of Chemical Industry in Basle." Dr. G. Engi. 7 p.m.	Salters' Hall, St. Swithin's Lane, London.
14	"Dust Explosions." Professor R. V. Wheeler. 9 p.m.	Home Office Industrial Museum, Horseferry Road, London.
15	Presentation of Society's Medal to Dr. Herbert Levinstein. 10.30	Royal Academy of Music, London.
15	Annual Dinner. 7 p.m.	Wharncliffe Rooms, Great Central Hotel, London.
16	"Hydrogen Ion Concentration." Dr. H. Sörensen. 10.30 a.m.	Leathersellers' Hall, St. Helen's Place, London.
16	Discussion on "Smoke Abatement." 3.15 p.m.	7I, Eccleston Square, Westminster.
16	Institute of Fuel. Discussion. 10.30 a.m.	Great Central Hotel, London.

The Action of Hydrogen on Coal

Investigations at H.M. Fuel Research Station

It is now seven years since investigations on the action of hydrogen on coal were commenced at the Fuel Research Station, East Greenwich. The Annual Report of the Fuel Research Board for the year ending March, 1930, contained a summary of the results obtained, but details of the actual investigations involved have only recently been forthcoming by publication of Fuel Research Technical Paper No. 29. ("The Action of Hydrogen Upon Coal," by A. Crawford, F.A. Williams, J. G. King and F. S. Sinnatt. H.M. Stationery Office, pp. 37, price 1s. 3d. net).

It has been known for some years that a considerable proportion of the coal substance of suitable coals can be liquefied by the action of hydrogen under pressure and at elevated temperatures. The commercial aspect of this process has also been investigated by a strong British Syndicate, with which the Department of Scientific and Industrial Research has been in close touch. Work at the Fuel Research Station, however, has been directed more particularly to a study of the nature of the reactions that take place, and to their applicability to the various types of British coals, for it was noticed at an early stage that a less drastic treatment than was required for liquefying the coal had a marked effect on its caking properties, and that by this means a weakly caking coal could be converted to a strongly caking coal, and some caking properties could even be conferred on anthracite. The present paper, therefore, gives details of the experiments on this aspect, which has been termed "partial hydrogenation."

Experimental Equipment

These experiments, on the laboratory scale, were carried out in two types of pressure vessel. For the earlier experiments a cylindrical steel bomb 30·5 cm. long × 9 cm. in internal diameter was used, arranged with its longer axis in a horizontal position, and rotated slowly throughout an experiment. It was heated externally by the sensible heat of combustion gases. Subsequently two bombs of internal measurement 32·5 cm. × 8·8 cm. giving a capacity of about 2 litres were employed. These were also rotated about a horizontal axis, but were heated directly by small gas flames. The earlier experiments were conducted similarly to those described by Bergius, the coal in the form of a fine powder, passing a 60 I.M.M. sieve, being charged into the bomb and a quantity of vehicle added, and also a proportion of iron oxide (luxmasse). These ingredients were well mixed, the bomb closed, and hydrogen compressed into the bomb until the pressure reached 100 kg. per sq. cm. The bomb was then heated under the desired conditions and, after cooling, the residual gas was blown off through a meter and a sample taken for analysis, after which the bomb was opened and the products removed. The addition of vehicle, as employed by Bergius, was to facilitate the reaction between the coal and the hydrogen and lessen the tendency towards coking. As vehicle, tars, from which the lighter fractions had been removed, were employed. The use of iron oxide was also first advocated by Bergius for the purpose of fixing the sulphur of the coal.

During these experiments it was noticed that the movement of the stirrer was distinctly audible when the bomb was rotated, in spite of the presence of the coal. Audibility, however, did not persist throughout the whole of an experiment, for there appeared to be some change in the state of the contents of the bomb which caused the stirrer to become inaudible at about 330° C. with bituminous coals. As the temperature was raised still further a point reached when the movement of the stirrer again became audible. Evidence of changes in the coal substance below the temperature of 450° C. normally employed by Bergius was supported by an examination of the temperature/pressure curve recorded for an experiment. In this curve the pressure increased uniformly with the temperature until the neighbourhood of 370° C. was reached, when absorption of hydrogen became so rapid that, although the temperature continued to rise, the pressure remained constant for a while and then decreased, showing that reactions between coal and hydrogen were proceeding rapidly.

In order to study the nature of the intermediate hydrogenation products formed at this stage, an experiment was conducted in the absence of a vehicle, the presence of which tends to mask the effect, the coal used being Arley. After discharging and sampling the residual gas the bomb was opened and it was found that the product had obviously passed through a state of fluidity and had solidified on cooling to a brittle pitch-like mass with a bright glossy surface, but possessing a dull fracture. It appeared to be homogeneous and was free from bubbles. Decomposition of the coal in any way akin to carbonisation did not appear therefore to have taken place. A small amount of water was also recovered from the bomb, on which a thin oily film was visible. Analysis of the residual gas from the bomb showed its composition to be very little different from that of the hydrogen originally charged, the amount of molecular hydrogen which had reacted during the experiment was less than 1 per cent. of the weight of coal employed. A portion of the solid product was carbonised in the Gray-King assay in order to determine how the properties of this product varied from those of the original coal. The tar yield was found to have increased, but the most striking observation was the alteration in the type of coke produced. Whereas the original Arley coal gave a hard, slightly swollen coke, the product yielded a highly swollen coke. This interesting observation, therefore, led to a comparison of caking indices by the Campredon method, when it was found that the coal gave an index of 24 whereas that of the product, 39, was well outside the normal scale. It was immediately recognised that such an increase in caking power was of importance from point of view of the chemical study of coal and that of possible commercial application.

Conversion of Non-Coking to Coking Coal

The possibility of being able to convert a non-coking into a coking coal immediately presented itself and an experiment was carried out using "Ellistown Main," a non-coking metalignitous coal. This coal when carbonised in the assay yielded a pulverulent residue, but after heating with hydrogen under pressure in a bomb to a maximum temperature of 378° C. the product yielded on carbonisation a dense hard coke. This property of forming coke might have been due to the presence in the product of free oil; free oil had already been observed as a film on the walls of the bomb. One of the products obtained was accordingly subjected to extraction with benzene in a Soxhlet apparatus to remove the free oil, when it was found that the proportion which was soluble was several times in excess of that obtained from the coal before treatment with hydrogen. The residue after extraction did not give quite so strong a coke as before, but it was still strongly coking.

This brief outline has been given to show how the study of the initial reaction between coal and hydrogen arose. In addition to the experiments mentioned, a number of similar experiments were conducted in the presence of iron oxide and other materials such as a mixture of iron oxide and alumina. Similar results were obtained, but the reaction between the coal and the hydrogen appeared to be accelerated. It was also noticed that if the bomb were kept rotating after the heating gas had been cut off, the product did not solidify till the temperature had fallen below 300° C. The importance of these observations on the conversion of a non-coking into a coking coal was obvious, and it was accordingly decided to conduct a series of experiments on one particular coal to determine what variation, if any, could be produced in the coke obtained upon carbonisation of the treated material.

Partially Hydrogenated Products

For want of a better term the products obtained by the limited action of hydrogen upon coals, resulting in the formation of materials solid at ordinary temperature, but which show distinct signs of having been in a liquid state and which have coking propensities greater than those of the original coals, have been called "partially hydrogenated" products, the process being termed "partial hydrogenation." At the time of the discovery of these solid products there was no mention in the literature of anything of a similar nature, but at the First International Conference on Bituminous Coal, Bergius stated that coal reacts with hydrogen at 300°–350° C. to give a pitchlike solid of high melting point which becomes liquid if treatment is continued at 450° C. No mentions however, was made of other properties, although Bergiu,

stated later that he considered hydrogenation to be a competition between coking and addition of hydrogen.

Graham and his co-workers have in several of their papers mentioned that in their hydrogenation experiments carried out at 430° C. for a period of eight hours in most cases, the residue insoluble in phenol nearly always has coking properties, often higher than those of the original coal, and that their product, which is soluble in phenol but not in chloroform, usually yielded a frothy coke on carbonisation. It is not at all clear whether the state of fusion through which these partially hydrogenated products have passed is necessarily concomitant with their increase of coking power over that of the original coal. The advent of fusion could possibly be due merely to the fusion of the original coal and might be independent of any interaction of the coal substance with hydrogen. Alternatively, it must be assumed that, as a result of hydrogenation, fusible substances are formed in which the remainder of the coal dissolves on heating, or else that the whole of the coal is modified in such a way that it fuses entirely, but there still remains the possibility that fusion could take place as a result of hydrogenation and still not give rise to increased coking powers.

General Conclusions of Investigation

The most important generalisation that can be drawn from the results of the investigations recorded is that the molecular hydrogen which enters into combination during the reaction does not remain in combination with the solid product. With the less mature coals, Turraun peat and "Pooley Hall," more than sufficient water is obtained as a product of reaction to account for all the gaseous hydrogen that becomes fixed. With Arley coal, however, the hydrogen that is used does not appear predominantly in any of the reaction products, whereas the most mature of the coals, "Tydraw," definitely shows addition of hydrogen to the solid product, with but little water formation. There is thus a gradation in behaviour from the least to the most mature coal. It must be a matter of doubt as to whether gaseous hydrogen reacts with the oxygen of the coal. With peat, more hydrogen is eliminated from the coal substance than appears as water. In the other cases, except with "Tydraw" coal, the hydrogen lost by the coal substance is about equivalent to that appearing as water. These coals, and particularly those of high oxygen content, must therefore form some water by internal decomposition, and it is not possible to differentiate between this water and that formed by reaction with gaseous hydrogen. Elimination of carbon as hydrocarbon from the coal accounts for some of the decrease of hydrogen. On the whole, the most probable explanation of the course of the reactions is that water formation takes place simultaneously by elimination from the coal and by interaction between gaseous hydrogen and oxygen contained in the coal, and with the less mature coals the position is complicated by the coal losing a part of its hydrogen and oxygen as oxides of carbon and hydrocarbons.

The action of hydrogen upon "Tydraw" coal is particularly interesting, in that only a small amount of water is formed. The reaction would, therefore, appear to be true hydrogenation, and this implies that the oxygen present exists in a different state of combination from that contained in more oxygenated coals, although the possibility of the oxygen in the latter existing in more than one type of chemical combination should not be precluded. The elimination from coal of oxides of carbon, hydrocarbons, and water, during partial hydrogenation, bears some analogy to the reactions which are considered to proceed during the coalification of plant remains. There are, however, distinct differences between natural coals of high coking power and partially hydrogenated products, such as the absence of organised structure in the products and the relatively high proportion which is soluble in solvents. It is not possible, therefore, to regard the process of partial hydrogenation as an up-grading of coal.

Synthetic Albumen

At a meeting of the Gesellschaft für Kohletechnik at Dortmund on Thursday, June 25, Professor Gluud announced that it has now been possible to make albumen synthetically. Details of the process have not yet been made public, but Dr. Gluud, who apparently took up the work begun by Dr. Emil Fischer and his pupil, Professor Abderhalden, states that it could be used for the production of synthetic albumen on a commercial scale.

Conditions in the Nitrogen Industry

Close of Amsterdam Conference

The Nitrate Conference, held at The Hague, terminated on Wednesday without arriving at a definite result. No official statement was issued, but the *Handelsblad* learns that divergences resulted from a refusal to apply on a large scale restriction of production by countries which cannot supply fully their own consumption. The conference will meet again in the second half of July.

"Cosach" Preferred Dividend Deferred

The directors of the Compañia de Salitre de Chile ("Cosach") which was formed under the auspices of the Chilean Government to unite the whole of the Chilean nitrate industry, have decided to defer payment of the dividend due on July 1 upon the company's Seven per cent. Cumulative Preferred shares of 100 gold pesos each. A similar decision has been taken in respect of its Seven per Cent. Cumulative £5 Preferred shares by the Lautaro Nitrate Co., which is a subsidiary of "Cosach." The reasons officially given for the postponement are, first, the short time which has elapsed since the formation of the Chilean company; and, secondly, the need at this stage of conserving cash resources. At the same time the directors express their utmost confidence in the future of the company.

"Cosach," it is pointed out, is participating in the nitrogen negotiations now being conducted covering markets outside the United States. Shareholders are informed that substantial progress has been made towards an agreement embodying the reasonable demands of the Chilean industry, and such an agreement should aid in restoring that industry to its proper position in the European nitrogen market. In responsible financial circles the decision to defer dividend payments is regarded as a wise step. As a result of the fusion the outlook for the Chilean producers has undergone a most important change, and they are now able to present a united front to the manufacturers of synthetic products. It is understood that sales of Chilean nitrate in the year just ended have been about 15 per cent. under normal, a result that is regarded as satisfactory after making allowance for world conditions, and more particularly for the acute depression prevailing in agriculture. Existing prices for Chilean nitrate are reported to allow a fair margin of profit, and the representatives of the industry are not unwilling to reduce their prices further. It has, however, been agreed to retain existing prices during the current month.

Acetate Products Corporation

Proposed Winding-Up

An extraordinary general meeting of Acetate Products Corporation, Ltd., is to be held at the Hotel Metropole, London, on July 20, at 12 noon, to consider a resolution to wind-up the corporation and appoint Sir W. H. Peat as liquidator. The company was formed in 1928 and has an issued capital of £661,500.

The directors, in a circular, say that this step has become necessary owing to the fact that the corporation now finds itself without the necessary working capital to finance the purchase of raw materials and the payment of wages. Delay was experienced in the completion of the new factory at Croydon, also in securing from the manufacturers the quality of cellulose acetate necessary to the manufacture of plastics. The corporation has for some weeks been manufacturing and selling certain types of material and has secured and begun to execute a running contract for acetate sheeting. "There is every probability of this being steadily increased," states the circular, "but exploration of other known outlets is restrained owing to lack of working capital. There are no charges on any of the assets, and the corporation owes no money to its bankers. There is, therefore, a reasonable chance that a liquidator will be able to reconstruct the business upon a basis which will receive the approval of the shareholders."

British Industries Fair, 1932

The Department of Overseas Trade announce that they have appointed Dorland Advertising, Ltd., as their advertising agents for next year's British Industries Fair, which opens in London and Birmingham on February 22.

An Item of Industrial History

By E. F. A.

THE history of men, of inventions, of industries, or of individual firms is at least as interesting as that of kings and ministers or of wars, and in the long run of more importance to future progress. No excuse is, therefore, required for selecting for comment some points in the histroy of a firm of high repute in a branch of the chemical industry, viz., the Philadelphia Quartz Co., which has just celebrated the centenary of its foundation.

It was founded by a Quaker, Joseph Elkinton, who, after training as a silversmith and undertaking service as a missionary, began the manufacture of soap and candles with an initial capital of $1,697.33\frac{1}{3}$—a bare £350—as recorded in his day book, such a calling being more in keeping with his beliefs. An indication of the minute care with which the business was conducted by him is shown in the fraction of a cent; it contrasts sharply with present-day extravagance.

In those days barter and exchange were common practice, and the records show that Elkinton received much besides cash for his soap—he also paid part of the cost of his buildings in this commodity. The business prospered at home, perhaps because of its fair dealing, and began to gain a place in export markets as well.

The second generation in due course became active in it. About the end of 1857 a son, Thomas Elkinton, began to experiment in the manufacture of soluble glass, silicate of soda, and by 1861 this had become a staple in the company's products. There are references to repairs and to trouble with the furnaces in the day-books. The war between North and South shut off Southern supplies of rosin from the Northern soap-makers, and most other raw materials soared in price; all this was favourable to the development of the new low-priced detergent, which was tried in admixture with soap and found useful. At that time the demand for candles fell off on account of the introduction of the far more brilliant kerosene lamps. Silicated household soaps became popular, and other makers purchased sodium silicates from the Elkintons. In 1864 a bulletin was published on the uses of the new chemical, forming the first of a long series since issued which form a veritable mine of information on the subject and utilise knowledge in every branch of science.

About this time the silicate business was launched separately as the Philadelphia Quartz Co., the soap business being continued by the family. Soon new uses of silicate as a binder and an adhesive found favour and the foundations of a great industry were in the making. A large number of different brands of the commodity were manufactured. In spite of difficulties—Elkinton writes, "there is not that Christian zeal and love apparent amongst the soapmakers manifested towards silicate of soda which it would be pleasant to see"—sales increased especially in the hands of one C. W. Goudy, who seems to have been unusually gifted as a salesman, a characteristic inherited by his son. But the Elkintons made it their policy to sell more than just silicate of soda—namely satisfaction to their customers. Perhaps this is why they have continued to prosper.

In 1879 the third generation—William T. Elkinton, the present President—came to work in the factory at a salary of 18s. per week. Ten years after we read of experiments to fire the furnace with crude oil as fuel, which promised to be successful. A later entry tells us "we had to give up the using of oil because of affecting the insurance." The introduction of the corrugated paper container in the early nineties as a substitute for the wooden box created an evergrowing demand for silicate as an adhesive, and it has steadily increased to absorb the output of eight factories located strategically in various parts of the U.S.A., so as to reduce transport charges. To-day the number of special varieties of silicate, solid or in solution, sold is large; they are each based on a scientific study of the best ratios of acid to alkali to give the desired results. As a consequence, the number of applications is an ever-growing one, largely fostered by the investigations of the makers.

The firm has an innate belief in the advantages of practical science and it has prospered accordingly. Conducted with thoroughness and economy it still has as its motto that wise and kindly admonition of its founder to his son "to continue to dwell under a proper regard for the best things."

"Micro-Porous" Rubber

A New Product with Many Uses

RUBBER resembling either cardboard or soft leather in outward appearance and lending itself to a variety of new uses is now being made by a process patented by Dr. H. Beckmann, professor at the Engineering College, Hanover. "Micro-porous" rubber, as it has been named, will, even under the microscope, show no outward trace of porosity. It is permeated by enormous numbers of very minute pores, the average diameter being 0·0004 millimetre, which is the order of magnitude of the wavelengths of visible light. An area of one square centimetre thus comprises as many as 500 million pores, endowing the material with an extraordinary power of absorption and enabling moisture up to 60 per cent. of its own volume to be absorbed. Micro-porous soft rubber has a light yellow colour; micro-porous hard rubber, a light brown colour. When either is exposed to a pressure of several hundred atmospheres it loses it porous structure, assuming the light brown hue of solid soft rubber and becoming perfectly transparent, but this resulting material, by a short-time exposure to hot vapours, can be reconverted into the micro-porous variety.

Many applications of these micro-porous rubbers have already been developed—as in the lining of the large filter-presses. Owing to the great resistance offered to oils, they can be employed as a lubricating cushion or wick for feeding the bearings of vehicles and machines with a uniform supply of oil, which at the same time is automatically filtered. Sheets of micro-porous rubber are also excellent substitutes for blotting-paper; another application has been found in the manufacture of diaphragms in the accumulator industry. In pulverised form it is said that the hard variety can be used very effectively for air filters. When used as a veneer, applied in very thin layers to metal plates, they take away the feeling of cold otherwise inseparable from metallic contact. In its insensibility to moisture this product compares favourably with wood veneer, especially as the material will neither bulge when moistened nor crack as it is being dried.

Beet-Sugar Subsidies

Co-operation of Interests Desirable

THE cost of the sugar-beet industry in the form of subsidy and rebate in taxation has been almost £30,000,000 during the seven years it has been operated in this country under subsidy conditions. This point is disclosed in a report on the industry at home and abroad issued by the Ministry of Agriculture, on Monday last, June 29.

This report points out that the tide of economic pressure in the form of falling sugar prices seems for the moment to have overtaken the industry in its forward progress, and, although the situation has been relieved by the Government's offer of special assistance, there is the necessity for the industry to tackle certain internal problems before the subsidy goes altogether, as it is due to go in 1934. Chief among these is that of reconciling the purely home-grown sugar interests and the purely refining interests in this country. Reference is also made to the suggestion that the best hope for the future lies in the unification of all sugar interests in this country, both manufacturing and refining, accompanied by satisfactory safeguards for the sugar-beet grower.

Nearly thirty million tons of sugar are now produced annually throughout the world, whereas before the war less than twenty million tons were produced. The test of cultivation on commercial lines has confirmed the anticipation that this country is eminently suitable for sugar-beet cultivation, and there have been successful growers of the crop in every country in England and Wales, and in some counties in the South of Scotland. The average yield of beet per acre throughout the country does not yet, however, compare favourably with foreign results, being from $1\frac{1}{2}$ to $2\frac{1}{2}$ tons less than the average obtained in foreign countries.

The industry has provided substantial employment in the field, at the factory, and in connected industries, including transport. The number of persons employed in the beet-sugar factories in 1930 was 9,900, the period of employment each year being from three to four months, except for about 25 per cent. who are employed throughout the year. In 1929–30 the wage bill was £670,000.

Hugh Bell: An Appreciation

By Sir Ernest Benn, Bt.

THERE never was a straighter course than that steered by Sir Hugh Bell for the record time of 87 years. Truth, principles, foundations, facts, as he understood and saw them, were the only things in which he deigned to take an interest. Thus he was out of party politics, although he stood for Parliament once as a Conservative and once as a Liberal. "Drummed out of every political party" was one of his familiar boasts. The tactical manœuvres, the trimming, the hedging, the compromise of public affairs had no interest for him. He started in an age of freedom, was one of those great masters who took advantage of that age to found the best of our industrial institutions, and was never willing to acknowledge any error in the methods which put us at the head of the economic world or to tolerate the criticisms and modifications of later times. Indeed, it was to those modifications that he attributed most of the ills from which we suffer.

He did as much public work as any two ordinary public men, but it was free work, and he therefore missed altogether the backscratching benefits of party discipline and office. In his 87 years he had more time than most of us in which to do things, but he filled every "unforgiving minute" of that long period with much more than any ordinary "sixty seconds' worth." The privilege of his friendship did not come to me until he had reached threescore years and ten and, as he often said, "ought to be dead," but in those seventeen years I do not remember an occasion on which the next appointment was more than an hour away. Thirty years my senior, he would take the stairs and leave me to enjoy the assistance of the lift. From his fat, well-thumbed diary he would tell you three months ahead how every hour of the day was allotted.

He was possessed of a rare knowledge of the facts of life, a knowledge which the world has almost lost and will learn again through suffering that Bell would have saved it. He possessed all the learning of the economists and statisticians and all the practical knowledge of the responsible business man, and was therefore seldom to be found in complete agreement with either class. Because of current fashions in thought and because he was a whole-hogger for freedom and an individualist, he was regarded by those who never knew him as callous and hard. Yet, in fact, he was the gentlest, sweetest, most lovable soul, going through life protesting against "sloppy sentimentalism" and spreading wherever he went inspiration, encouragement and affection.

He was always ready for the end; sometimes, especially when oppressed with political folly, he would ask for it. There was no flinching, no fear, no attempt to escape. Nothing but a marvellous determination, maintained right up to the last hour, that if there were any more of life, it should at least be as well filled as the rest.

Government Chemists' Salaries

THE proposals submitted by the official side of the Departmental Whitley Council of the Government Chemist's Department for the application of the report of the Committee on Scientific Staffs in Government Establishments, which was issued last year, have, *The Times* correspondent states, resulted in disagreement, and will be put into effect as from August 1 next by administrative action. The grade of temporary assistant chemists is to become obsolescent, the more important duties being taken over by the grade of "chemist." In the professional grades the "official side" proposals, with the present organisation in parentheses, are as follows:—

Thirty-nine chemists, £200–£450 (39 temporary assistant chemists, £160–£220).

Four chemists, £450–£550 (27 chemists, Class II., £225–£400).

Eleven senior chemists, £550–£650 (12 chemists, Class I., £450–£650).

Six principal chemists, £700–£850 (six superintending chemists, £700–£850).

The staff side contend that under the official side's proposals there are not sufficient professionally qualified chemists to carry out the work efficiently, and that they do not contain any recognition of the conclusion reached by the Carpenter Committee "that the present schemes of grading and salary scales in the establishments under review are generally inadequate."

Chemical Matters in Parliament

Imported Camphor

IN the House of Commons on Thursday, June 25, Sir George Hamilton (Ilford) asked the president of the Board of Trade whether he can state the value of the imports of natural camphor and synthetic or artificially produced camphor for the years 1928, 1929 and 1930, respectively.

The President of the Board of Trade (Mr. William Graham): The declared value of the total imports of camphor into the United Kingdom during the years 1928, 1929 and 1930 was £103,077, £106,745 and £57,345, respectively. I regret that separate statistics relating to the importation of natural camphor and a synthetic camphor are not available.

Oil Production

On Monday, June 29, Lieut.-Commander Kenworthy asked the Prime Minister what bodies are inquiring into the possibilities of obtaining more of the petrol and other mineral oils used in this country from home resources?

The Secretary for Mines (Mr. Shinwell): I have been asked to reply. The question of stimulating the production of oil from home sources is being pursued very actively by the Government through the two Departments primarily concerned, namely, the Mines Department, which deals with the general and commercial aspect of the question, and the Department of Scientific and Industrial Research, which is responsible for research. A close liaison is being maintained between these two Departments. The matter is also kept under periodic review by the Oil Board, and a special Committee of the Cabinet has one aspect of the question under immediate consideration. Tests of the oil fuels produced from coal have been and are being carried out by the Admiralty, War Office and Air Ministry.

Major Colville (Midlothian and Peebles, Northern): Is it not the case that the largest existing sources of home supply in Scotland are in danger of being closed down?

Mr. Remer (Macclesfield): Is the hon. Member aware that firms who are interested in this matter have great difficulty in obtaining any information from the Ministry of Mines?

No reply was given to these questions.

More Trade with South America

The Purpose of "Industria Britanica"

WITHIN the next few weeks the first issue of *Industria Britanica* will be published, the new monthly journal in Spanish which will bring news of British industry into the South American markets, and so continue the impetus given to our trade by the recent royal tour.

Preparations for the enterprise were made during the Prince of Wales's visit to Buenos Aires for the wonderfully successful British Empire Trade Exhibition, and encouragement has been received by the publishers (Benn Brothers, Ltd.) in a cordial message from His Royal Highness. The President of the Argentine Republic and the British Ambassadors to Argentina and Chile also have expressed their appreciation of this pioneering work for British prosperity. With the full support, in addition, of the Federation of British Industries, *Industria Britanica*, appearing at a time when there are real signs of returning prosperity, is inevitably destined to play a leading part in achieving Britain's due share of trade in Spanish-speaking South America.

Apart from the immense value to British traders of a journal reaching foreign subscribers in their own language, the publishers have taken special care to enhance the paper's utility by setting up a special translation bureau for advertisers, whose copy and correspondence will there be translated without extra cost. *Industria Britanica* will have a guaranteed circulation among the buyers of British goods in 17 Spanish-speaking countries, and will be sold at the price of 1s. (one pesa).

Anhydrous Ammonia in Canada

THE Canadian Salt Division of the Canadian Industries, Ltd., is now manufacturing anhydrous ammonia in sufficient quantities to take care of the entire Canadian demand. The actual production of this chemical was started at the Sandwich plant in June, 1930, but the announcement was withheld until the success of the venture had been thoroughly demonstrated. The Casale process is employed under exclusive Canadian rights purchased by Canadian Industries, Ltd.

Thallium and Thallium Salts

By A. V. Petar

The following article summarises present-day information upon thallium and thallium salts, as recently investigated by the United States Bureau of Mines and published in their Information Circular 6453.

THALLIUM is one of the rare metals that has come into commercial use within recent years. Its comparative scarcity, combined with a resemblance to lead, have doubtless retarded its development, but although production is still measured in pounds rather than in tons, it is now finding application in a number of fields. The earliest commercial use of thallium was as a constituent of optical glass of higher refractive power than similar glasses containing lead. One of the later applications to attract attention was the use of the oxysulphide in a sensitive electrical device similar to the selenium cell. The "Thalofide" cell, which was patented in 1919, constituted for a time the most important outlet, but during the next few years the limited use of thallium and its salts in other fields was insufficient to absorb an annual production of a few hundred pounds, and in the United States the price dropped from $18 per lb. in 1922 to $5 per lb. in 1924. Beginning in 1925, however, several new uses were developed, and the demand for thallium increased sufficiently to cause a recovery in price to the present level of from $12 to $15 per lb.

There are no commercial ores of thallium, although it is present in small quantities in many minerals. The supply was formerly obtained solely from flue dusts which accumulate in sulphuric acid plants where pyrites is used as the source of sulphur. The thallium content of these flue dusts is usually about 0·5 per cent., and the thallium is produced only as a by-product, although the greater proportion of the present domestic supply in the United States is a by-product of the purification of cadmium, which is itself a by-product of the smelting of other metals.

Physical and Chemical Properties

The physical and chemical properties of thallium are very similar to those of lead. The metal is white with a bluish-grey tinge, somewhat paler than lead and softer than lead. It has a bright metallic lustre when freshly cut but dulls quickly when exposed to air. It is malleable, but has little tenacity, and can be extruded but not drawn into wire. Determinations made for the melting point range from 204° to 304° C., but 303·5° C. has been accepted by the International Critical Tables. According to A. Lamy, the specific gravity is 11·86, although slight variations from this figure have been given by other investigators. The metal has a crystalline structure and when bent gives forth a sound like the "cry of tin." It amalgamates with mercury and forms alloys with many other metals. It is slowly soluble in alcohol, insoluble in liquid ammonia, and combines directly with sulphur, phosphorus, and the halogens.

The discovery of thallium dates back to the early part of 1861, when Crookes noted a bright line in the spectrum of the selenium residues from a sulphuric acid factory in the Harz Mountains. He was looking for tellurium, but spectroscopic examination revealed the presence of an unknown element, to which he gave the name "thallium," a word which is frequently employed to express the green tint of young vegetation. In 1862 Lamy observed the green spectral line from the chamber deposit of a sulphuric acid plant where Belgian pyrites were roasted, and obtained several hundred grams of the metal, with which he was able to make considerable progress in determining the chemical and physical propoerties of the new element.

Applications in Alloys

Alloys of lead and thallium are somewhat unusual in that they have higher melting points than either of the component metals; they are, therefore, used in rather small quantities in special types of electrical fuses. An alloy containing 10 per cent. thallium, 20 per cent. tin, and 70 per cent. lead is resistant to the corrosive action of mixtures of sulphuric, nitric, and hydrochloric acids. This alloy has been recommended for use as an anode for the electrolytic deposition of copper, since its corrosion is less than one-fifth that of lead alone.

In a discussion of the possibility of using lead-base bearing metal in place of tin-base, Ellis (*Amer. Metal Market*, 1928, **35**, 1, 44) reports that experiments indicate that the addition of thallium to lead-base alloys markedly improved their resistance to deformation, and that yield point and ultimate strength tests show that an alloy containing lead 72, antimony 15, tin 5, and thallium 8, is superior to the best tin-base bearing alloy. Silver alloys containing as much as 22 per cent. thallium have been patented by I.G. Farbenindustrie A.-G. (Brit. Pat. 297,665) on account of their resistance to chemical action. A liquid amalgam with mercury, containing thallium to the extent of 8·5 per cent., has found use in thermometers for recording temperatures as low as —60° C.

Commercial Uses of Thallium Salts

Many uses have been found for thallium compounds, but by far the most important commercial outlet for the element is the utilisation of thallium sulphate as a poison for rodents and as an insecticide for ants. This sulphate has the advantage of being tasteless and odourless. Because of their high refracting power, thallium compounds are used in the manufacture of certain kinds of optical glass in which a high refractive index is required. The oxysulphide of thallium is used in the "Thalofide" cell, which is claimed to be more sensitive to light than the selenium cell under conditions of low intensity and long wave length. Its electric resistance drops 50 per cent. on exposure to a quarter-foot candle. Several patents for the "Thalofide" cell were issued in 1919 and 1920 to T. W. Case who has also patented a compound of thallium and bromine (U.S. Patent 1,342,842) which is used as an electric resistance material in the Bellphotophone and similar apparatus

The use of thallium and its compounds to prevent knocking in internal combustion engines has also been patented by the Asiatic Petroleum Co., Ltd., and A. C. Egerton (Brit. Pat. 279,560). According to the patent specifications, thallium or thallium oxide may be vaporised outside the cylinder by an electric arc or a thallium compound may be mixed with the fuel or otherwise injected into the engine. The compounds which may be used include thallium ethyl, benzylate, phenylethylate, oleate, amyl-alcoholate, and acetoacetate. Thallous chloride has found use as a "getter" in tungsten lamps to prolong the life of the filament. It is one of the few lower chlorides that is more stable than the compound of the higher state of oxidation.

In a study of heavy liquids for mineralogical analyses the Bureau of Mines found that the most suitable liquid for sink-and float work on minerals of high specific gravity was a water solution of thallous formate-malonate. This double salt, which has a specific gravity of 4·9, melts at 60° C. and is miscible in all proportions with water. At room temperatures the salt is soluble enough to give a solution with a specific gravity of nearly 4·3. As a liquid of intermediate gravity, an aqueous solution of thallous formate is recommended; a maximum specific gravity of 3·5 is reached at room temperatures, and gravities up to 4·95, the gravity of the molten salt, may be obtained if desired.

Trading Conditions Overseas

A MEMORANDUM on trading conditions in Persia prepared by the Commercial Secretary to His Majesty's Legation at Tehran has been issued by the Department of Overseas Trade to firms whose names are entered on its Special Register. British firms desirous of obtaining a copy of this memorandum should apply to 35, Old Queen Street, London, S.W.1, quoting Ref. C.X. 3586.

A similar memorandum dealing with methods of trading and the appointment of agents in the Philippine Islands has also been issued: Ref. C.X. 3571.

Fertilisers in India

RELATIVELY small quantities of fertilisers are imported into India, notwithstanding the dependence of the majority of the inhabitants upon agriculture as the principal source of revenue. Imports, which in 1929 were double those of 1927, fell in 1930 to less than 65,000 tons.

From Week to Week

AFTER EXPERIMENTS lasting five years, motor spirit has been produced from coal at Welbeck Colliery, near Worksop, Notts. The spirit is said to be clean and economical, and all tests were successfully passed.

A DELEGATION OF MINE-OWNERS and miners at Brussels has asked the Belgian Government to restrict the importation of foreign coal, owing to the serious position of the mining industry at Brussels.

AT THE MONTHLY LUNCHEON of the Oil Industries Club, to be held on Tuesday, July 7, at the Great Eastern Hotel, London, Dr. J. F. Crowley, a well-known authority on fuel problems, will give an address on "How the Oil Industry can assist the Coal Trade."

SIX MILLS at Duffryn Tinplate Works, Morriston, will be put in commission this week, after having been idle for several months. Part employment will be found for six to eight hundred men. Four mills at Glantawe Tinplate Works, Pontardawe, Swansea Valley, are also to restart immediately.

ACCORDING to a report from Johannesburg, a rich deposit of phenacite in lode form has been discovered in the North Eastern Transvaal. Samples, assayed at 12 to 15·5 per cent. beryllium, have been obtained during the sinking of the shafts. It is anticipated that the mineral will find a good market in Europe and America.

THE DEPARTMENT OF OVERSEAS TRADE announce that Sir J. J. Broderick, until recently Commercial Counsellor at Washington, left the United States of America on June 11, to take up his appointment as His Majesty's Minister at Havana. Mr. H. O. Chalkley (formerly Commercial Counsellor at Buenos Aires) has succeeded Sir John Broderick as Commercial Counsellor at Washington.

A PRELIMINARY DRAFT CONVENTION was submitted for consideration of the Conference on the Limitation of the Manufacture of Narcotic Drugs at Geneva, on Friday, June 26. This draft convention is based on the Franco-Japanese proposals, and is the result of private conversations between the delegates of France, Germany, Japan, and Spain, assisted by the delegates of the United States.

THIRTEEN MEN who played a conspicuous part in the rescue work on the occasion of the disastrous explosion at the chemical works of Hickson and Partners, Ltd., Castleford, in July last, received awards for gallantry from the King at the Investiture held at Buckingham Palace on Friday, June 26. Among the recipients was Mr. G. H. Frank, formerly a director and works manager at Hickson and Partners, Ltd.

A NEW TRADE MARKS LAW providing for the registration of trade marks in Iraq came into force on June 16. This law supersedes the existing law relating to trade marks in 'Iraq. Trade marks registered in Iraq between July 15, 1928, and June 16, 1931, will, if the registration is still in force, be regarded as if they had been registered under the new law, a copy of which can be consulted in the Public Library of the Patent Office, Southampton Buildings, Chancery Lane, London, W.C.2.

IN the course of a paper read before the Devonshire Association last week, Mr. G. F. Tregelles suggested a new industry for North Devon. Referring to the economic value of seaweed for iodine production, Mr. Tregelles said it was regularly harvested for that purpose in West Cornwall and in the Channel Islands, where producers were paid £8 a ton for the kelp. The Irish Free State was also doing its best to regulate the trade. Careful burning in a kiln of four tons of seaweed would give 15 cwt. of kelp, yielding 13 lb. of iodine; but reduced to ash in a retort, four tons of seaweed would yield 30 cwt. of ash and 29 lb. of iodine.

LEAVE has been granted to the Minister for Industry and Commerce of the Irish Free State to introduce a Mines and Minerals Bill. It is proposed to establish a Board to control the mining and mineral producing industries and to make leases of workings of holdings belonging to or vested in the Free State Government. Provision will also be made to facilitate the working of mines and minerals and to amend the present laws in respect to mines and other purposes incidental to these matters. This Bill will be introduced before the end of the present session and is expected to have an easy passage through the Dail and the Senate.

DIPLOMA COURSES arranged for students preparing to become industrial and analytical chemists and metallurgists are outlined in the new Calendar of the Royal Technical College, Glasgow.

A NEWS REPORT from Moscow states that the Soviet Union plans to spend 300,000,000 dollars in buildings and equipment for the food industries during the remainder of this year, paying special attention to sugar, flour, vegetable oils and fisheries.

THE UNITED STEEL CO. gave notice on Saturday last, June 27, to all members of its staff at the iron and steel works, collieries, and iron ore mines of a graduated reduction of 7½ per cent. in salaries. This reduction, however, does not apply to the workmen.

GREEFF CHEMICALS (MANCHESTER), LTD., of Parsonage Chambers, Parsonage, Manchester, who are agents for R. W. Greeff and Co., Ltd., of London, have removed their office to the Royal Exchange, Manchester. Their new phone number is Blackfriars 9407–8.

THE SYLVANIA INDUSTRIAL CORPORATION, manufacturers of "sylphrap," the transparent cellulose paper which is the only successful competitor of cellophane in the United States, have started construction of a million dollar addition to their plant at Fredericksburg.

THE APPOINTMENTS BOARD of the Imperial College of Science and Technology, South Kensington, London, S.W.7, is available for use, without fee, by employers requiring men who have received a thorough training in science and technology. Applications should be addressed to the Secretary.

FROM NEW YORK it is understood that the negotiations for a merger between the Standard Oil Co. of New York and the Vacuum Oil Co., made possible by the Department of Justice's decision to discontinue its opposition, have reached the final stage, and an announcement may be expected shortly.

THE ARGYLL CHEMICAL WORKS, Oban, formerly owned by Mr. J. Boni, have been purchased by J. and D. MacCowan, Lochvoil, Oban, with a view to carrying on the manufacture of sheep dip. The factory will be under the same management as previously. Various other requirements will be supplied in addition to the chief output of powder, liquid and paste dips.

THE IRAQ GOVERNMENT has declared open for oil concessions the whole of the land west of the Tigris, that is, the entire country except the Naft-Khaneh area (Anglo-Persian), and the territory east of the Tigris, which was conceded to the Iraq Petroleum Company, Ltd., in March of this year. Applications for concessions will be received at the Serai, Baghdad, up to September 30 next without restriction as to nationality.

A GERMAN CUPROCELLULOSE SILK SYNDICATE is to be established, coming into force at the same time as the International Viscose Syndicate for the German market. This follows an agreement reached between the Bemberg, Farbenindustrie and Kuttner concerns. The delay in establishing the Viscose Syndicate is said to be due to difficulties in the legal working out of the agreement, as basic approval has already been reached.

IN CONNECTION with the British Chemical Plant Exhibition, to be held at the Central Hall, Westminster, July 13–18, the Chemical Engineering Group is organising a special exhibit designed to emphasise the importance of research to industry. This exhibit is being arranged with the generous co-operation of the Department of Scientific and Industrial Research and the Industrial Research Associations. It will be staged in the Conference Hall, so that visitors to the exhibition of chemical plant will be able to pass straight on to the research section. A special brochure, dealing with the items shown in the research section, is in preparation.

E. F. HOUGHTON AND CO., of Philadelphia, Pennsylvania, U.S.A., manufacturers of oils and leathers, are constructing a new factory at Trafford Park, Manchester. This factory will be operated by E. F. Houghton and Co., of England, Ltd., and E. F. Houghton and Co., of Philadelphia, will merely own a controlling interest. Edgar Vaughan and Co., of Birmingham, who have been acting as sole distributors for England and Wales since 1905, will continue in that capacity, whilst James S. Crawford and Sons, of Glasgow, will distribute the new company's products in Scotland. The registered offices of E. F. Houghton and Co., of England, Ltd., are at Third Avenue, Trafford Park, Manchester.

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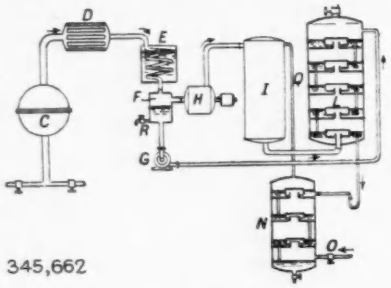
Patent Literature

The following information is prepared from published Patent Specifications and from the Illustrated Official Journal (Patents) by permission of the Controller to H.M. Stationery Office. Printed copies of full Patent Specifications accepted may be obtained from the Patent Office, 25, Southampton Buildings, London, W.C.2, at 1s. each.

Abstracts of Accepted Specifications

345,662. NITRIC ACID. Montecatini Soc. Generale per l'Industria Mineraria ed Agricola, 18, Via Principe Umberto, Milan, Italy. Assignees of G. Fauser, 4, Via Barazzuolo, Novara, Milan, Italy. International Convention date, February 27, 1929.

Ammonia is oxidised, in the presence of a catalyst, at atmospheric pressure, in a chamber C, and the nitrogen oxides and water vapour pass to a boiler D and cooler E, having small volume relative to their surfaces. Water collects in a vessel

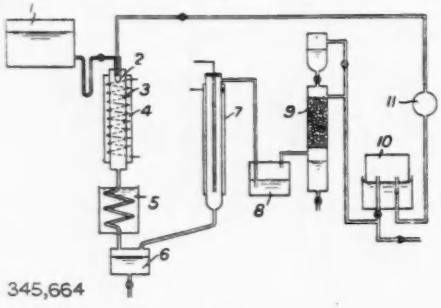


345,662

F, and the gases pass through a turbo-compressor H to a cooled chamber I supplied with oxygen through a tube Q. Nitrogen tetroxide is formed and is absorbed by water supplied by pump G to an intensely cooled absorption column L. A solution of nitrogen oxides in dilute nitric acid is obtained, and passes to a column N at 50° to 60° C., to which compressed oxygen is fed in order to obtain concentrated nitric acid.

345,664. CRACKING OILS. Imperial Chemical Industries, Ltd., Millbank, London, and W. R. Madel, Winnington Hall, Northwich, Cheshire. Application date, December 24, 1929.

Oil is fed from a tank 1 to a nozzle 2, and sprayed into a retort 3 by cracked gases supplied by a pump 11. The vapour



345,664

products are condensed in a coil 5 and pass to a separator 6, from which gases pass to an electric precipitator 7, washer 8, scrubber 9, and gasholder 10, to the pump 11, which forces them back to the retort.

345,668. TITANATES. R. H. Monk, and L. Firing, 20, St. Paul Street West, Montreal, Canada. Application date, November 18, 1929.

Precipitated titanium hydrate is treated with a peptising agent such as nitric or hydrochloric acid, or barium chloride in the presence of acid, and the colloidal dispersed mass is mixed with a coagulating agent such as a carbonate, oxide or hydroxide of the alkaline earth metals, or any metal the oxide of which is white, *e.g.*, barium carbonate. The resulting mass is calcined at 840° C. to form porous particles presenting numerous plane faces in different directions, and suitable for use as a pigment.

345,728. DYES. I.G. Farbenindustrie Akt.-Ges., Frankfort-on-Main, Germany, and A. G. Bloxam, London. Application date, January 20, 1930. Addition to 298,284.

A Bz1-benzanthronyl-Py1-pyrazolanthrone, in which the 2-positions of the benzanthrone and pyrazolanthrone nuclei are free, and which contains a substituted amino residue and may contain further substituents, is treated with an alkaline condensing agent. In an example, pyrazolanthrone is condensed with 6-Bz1-dibrombenzanthrone and the 6-monobromo-Bz1-benzanthronyl-Py1-pyrazolanthrone condensed with 1-amino-anthraquinone, and subjected to alkaline condensation. A large number of other examples are given.

345,735. AMINOARYL-THIAZOLES AND AMINOARYL-MERCAPTANS. A. Carpmael, London. From I.G. Farbenindustrie Akt.-Ges., Frankfort-on-Main, Germany. Application date, January 22, 1930.

Thiourea derivatives of the general formula aryl-NX-CS-NH_2, where X represents hydrogen or an alkyl- or aryl-group, are treated with chlorine or an agent yielding chlorine, such as sulphuryl chloride, sulphur chloride, sulphur dichloride, and antimony pentachloride. The products are aminoaryl-thiazoles, which may be treated above 100° C., with concentrated alkali solutions, yielding aminoaryl-mercaptans. In an example, phenyl-thiourea is treated with sulphuryl chloride in chlorobenzene solution to obtain 2-amino-benzothiazole, which may be converted into 1-aminophenyl-2-mercaptan.

345,743. DYES AND INTERMEDIATES. Soc. of Chemical Industry in Basle, Switzerland. International Convention date, February 2, 1929.

4 : 5-Dichlor-7-methyloxy-thionaphthene is condensed with the usual indigoid components to obtain thioindigoid dyes, which may be halogenated. In an example, 5 : 7-dichlorisatin is dissolved in chlorobenzene and treated with phosphorus pentachloride to obtain the α-chloride, which is then condensed with 4 : 5-dichlor-7-methyloxy-thionaphthene. The product gives fast violet shades. Other examples are given.

345,859. CYCLIC ALCOHOLS, KETONE ALCOHOLS AND THEIR NITRATES. W. Freiderich, 14, Mülheimstrasse, Troisdorf, Germany. International Convention date, October 10, 1929.

Tetramethylol-cyclopentanone, tetramethylol-cyclohexanone, and octamethylol-cyclohexandione and the corresponding cyclic alcohols are treated with nitric acid. The cyclic ketone alcohols are obtained by condensing the corresponding cyclic ketones with formaldehyde in presence of alkali, and are reduced to obtain the cyclic alcohols.

345,930. DYES. J. Y. Johnson, London. From I.G. Farbenindustrie Akt.-Ges., Frankfort-on-Main, Germany. Application date, September 25, 1929.

Diazotised aminobenzene sulphonic or carboxylic acid amides or their derivatives, such as the nitro or halogen derivatives, which are free from hydroxy or further sulphonic or carboxylic acid groups, are coupled with 1-phenyl-3-methyl-5-pyrazolones, which contain a hydroxyl group and a carboxyl group in the ortho position to one another in the phenyl radical, and which may contain further substituents. Thus, metanilic acid amide or *m*-aminobenzoic acid amide may be diazotised and coupled with 1-(2^1-hydroxyl-3^1-carboxyl-5^1-sulpho)-phenyl-3-methyl-5-pyrazolone. The dye may be after-chromed.

345,939. POLYMERISED HYDROCARBONS. Standard Telephones and Cables, Ltd., and W. E. Hugh, Columbia House, Aldwych, London. Application date, December 16, 1929.

A product resembling rubber or deresinated gutta percha is obtained by polymerising at 20° to 201° C., in the presence of a catalyst such as sodium or sodium amalgam, a mixture of a diolefine such as butadiene isoprene, dimethyl-butadiene or 2-methyl-pentadiene-2 : 4, and an aromatic olefine such

as styrene, naphthylethylene, divinyl-benzene and their homologues. An anti-oxidant, such as phenyl α or β-naphthylamine, may also be present, and a non-volatile hydrocarbon swelling agent may be added to render the product thermoplastic. The products may replace natural rubber partly or wholly in the insulation of submarine cables.

345,982. DYES. Imperial Chemical Industries, Ltd., Millbank, London. H. A. Piggott, and W. W. Tatum, Crumpsall Vale Chemical Works, Blackley, Manchester. Application date, September 30, 1929.

A halogenated pyrimidine is condensed with amino-anthraquinone containing one or two replaceable hydrogen atoms attached to the nitrogen atom, preferably in the presence of a copper compound. The products may be aroylated. In an example, 1 : 4-diamino-anthraquinone is condensed with 2 : 4-dichloro-pyrimidine yielding a product which dyes bluish-violet shades, and after benzoylation bluish-red shades.

345,985. CONDENSATION PRODUCTS OF ALDEHYDES WITH ACID HALIDES. S. P. Schotz, 48, Newcomen Street, Southwark, London. Application date, November 28, 1929.

Aldehydes, substituted aldehydes or substances yielding aldehydes are treated with acid halogenides in the absence of water. The mixture may be added to a finely powdered base, or a salt of a weak acid decomposed in the process, or powdered metal. Halogenating agents may also be present. The products are bleaching compounds, and several examples are given.

346,038. METHANOL SYNTHESIS. Soc. d'Études Scientifiques et d'Entreprises Industrielles Ougrée, Belgium. Assignees of E. Voituron, 264, Rue Ernest Solvay, Sclessin, Ougrée, Belgium. International Convention date, January 9, 1929.

Tricalcium phosphate is reduced with carbonaceous material and material such as silica and alumina in a blast furnace with a blast rich in oxygen. Phosphorus is removed from the gaseous products, and the carbon monoxide is treated with steam to obtain hydrogen and carbon dioxide. The latter may be removed. The oxygen content of the blast is such that the product contains hydrogen and nitrogen and carbon monoxide in the proportions required for the synthesis of methanol.

346,079. AMINES. Goodyear Tire and Rubber Co., 1144, East Market Street, Akron, Ohio, U.S.A. Assignees of A. M. Clifford, 1649, Honodle Street, Akron, Ohio, U.S.A. International Convention date, March 14, 1929.

Aniline and benzaldehyde are heated with aniline hydrochloride and distilled in steam with caustic alkali to split off aniline from the addition product obtained. The product is diamino-triphenyl-methane.

346,115. CYCLIC ACETALS. I.G. Farbenindustrie Akt.-Ges., Frankfort-on-Main, Germany. International Convention date, February 28, 1929.

Dihydric alcohols are condensed with unsubstituted araliphatic aldehydes to obtain cyclic acetals. Examples are given of the condensation of 1-oxo-2-phenylethane with 1 : 2-dihydroxyethane, 1 : 2-dihydroxypropane, 1 : 2-dihydroxybutane, 1 : 3-dihydroxybutane, and 2 : 4-dihydroxy-4-methyl-pentane, and several similar condensations.

346,180. QUINOLINE DERIVATIVES. Soc. of Chemical Industry in Basle, Switzerland. International Convention date, April 17, 1929. Addition to 270,339. (See THE CHEMICAL AGE, Vol. XVII, p. 39.)

A 2-halogen-quinoline-carboxylic acid amide or substitution product is treated with an amino-alcohol in the presence of an acid-binding agent. The resulting amino-alkoxy derivatives have therapeutic properties. In an example, 2-chloro-4-quinoline-carboxylic acid anilide is treated with β-piperidino-ethanol to obtain 2-piperidino-ethoxy-4-quinoline-carboxylic acid anilide. Several other examples are given.

346,118. DIHYDROQUINAZOLINE DERIVATIVES. Soc. Anon. Ledoga Prodotti Chimici e Farmaceutici, 11, Via Lazaretto, Milan, Italy. International Convention date, May 30, 1929.

Dihydroquinazolines of the type 6-R-3-(4-R-phenyl)-3 : 4-dihydro-quinazoline, in which R represents an alkyl or alkoxyl group or a hydrogen atom, are converted into their quarternary bases by alkylating or arylating with aliphatic or aromatic halogen derivatives, or dimethyl sulphate, and then treating with alkali. The products have a hydroxyl group attached to the nitrogen atom and also a group R^1 which may be a saturated or unsaturated alkyl group, a CH_2. CH_2. OH group, or an ester derivative, or a phenyl group. Therapeutic products are obtained, and examples are given.

346,221. ACROLEIN. Schering Kahlbaum Akt.-Ges., 170, Mullerstrasse, Berlin. International Convention date, June 15, 1929.

Glycerol vapour is passed at a temperature above 300° C. over salts which are higher than dibasic and which are distributed in metal tubes on pumice. In an example pumice is impregnated with 1 per cent. of normal lithium phosphate, dried, heated in a glass tube to 400° -420° C., and glycerol vapour passed over it. The product is fractionally distilled to obtain pure acrolein. Phosphates of copper, bismuth, silver, iron, and magnesium borate may also be employed at different temperatures.

346,237. REDUCTION OF ESTERS. H. T. Bohme Akt.-Ges., 29, Moritzstrasse, Chemnitz, Germany. International Convention date, September 23, 1929.

Alkyl esters of monobasic or polybasic acids are reduced by means of sodium and lower alcohols under a pressure of hydrogen of 15–20 atmospheres to obtain the corresponding monovalent or polyvalent alcohols. The sodium may be used in the form of piece or as a dispersion in xylene.

346,243. DYES. Durand and Huguenin Akt.-Ges., 40, Fabrikstrasse, Basle, Switzerland. Application date, July 19, 1930. Addition to 301,329.

Simple gallo-cyanines derived from meta-substituted alkylaniline and constituted as described in Specification 301,329 (See THE CHEMICAL AGE, Vol. XX, p. 105) are condensed with an aromatic hydroxy compound to obtain derivatives which still retain the meta substituent. The aromatic hydroxy compound may contain sulphonic groups, or the products may be sulphonated, and are suitable for use in discharge printing. In an example, the simple gallo-cyanines from nitroso-dimethyl or diethyl-*m*-toluidine and gallomide are condensed with resorcin β-resorcylic acid, pyrogallol or gallic acid, and the products may be sulphonated.

Specifications Accepted with Date of Application

350,425. Esters, Production of. H. T. Bohme Akt.-Ges. February 6, 1929.

350,446–7. Aluminium alloy. H. C. Hall and T. F. Bradbury. March 8, 1930. 350,446 addition to 323,353 and 350,447 addition to 334,430.

350,451. Metals for use as catalysts, Preparation of. A. A. Thornton. (*Soc. d'Etudes et d'Exploitation des Matières Organiques.*) March 10, 1930.

350,457. Vat-dyestuffs from di-benzanthrone and isodibenzanthrone, Manufacture of. S. Percival. (*A.C.N.A. Aziende Chimiche Nazionali Associate, and Belloni and Colli.*) December 10, 1929.

350,473. Dehydration of organic liquids. Soc. Anon. des Distilleries des Deux-Sèvres. August 26, 1929.

350,491. Sulphate cellulose and soda cellulose manufacture, and apparatus therefor. A. F. Zennström. May 13, 1929.

350,494. Refining crude oils and the like. S. T. Henderson and Imperial Chemical Industries, Ltd. March 12, 1930.

350,499. Dyes and dyeing. D. A. W. Fairweather, J. Thomas, and Scottish Dyes, Ltd. December 9, 1929.

350,501. Vat-dyestuffs containing halogen, Manufacture of. J. Y. Johnson. (*I.G. Farbenindustrie Akt.-Ges.*) December 13, 1929.

350,502. Purification of alcohols. Imperial Chemical Industries, Ltd., J. W. Armit, and G. E. Wainwright. December 13, 1929.

350,539. Separating aliphatic amines. I.G. Farbenindustrie Akt.-Ges. March 12, 1929.

350,563. Preservation of natural varieties of rubber and artificial rubber-like masses. A. Carpmael. (*I.G. Farbenindustrie Akt.-Ges.*) March 14, 1930.

350,573. Treating recovered sulphur, Method of. S. I. Levy. March 15, 1930.

350,574. Arsenic and chlorine from sulphur, Method of removing. S. I. Levy. March 15, 1930.

350,575. Vat dyestuffs of the anthraquinone series, Manufacture of. A. Carpmael. (*I.G. Farbenindustrie Akt.-Ges.*) March 15, 1930.

350,564. Thiuram mono sulphides, Manufacture of. A. Carpmael. (*I.G. Farbenindustrie Akt.-Ges.*) March 14, 1930.

350,577. Azo dyestuffs, Production of. British Celanese, Ltd., and G. H. Ellis. January 9, 1930.
350,603. Ferro-nickel magnetic alloys, Manufacture of. International Nickel Co., Inc. April 19, 1929.
350,625. Pyritic ores, Process and apparatus for the reduction of. L. Mellersh-Jackson. (*Patentaktiebolaget Grondal-Ramen.*) March 31, 1930.
350,643. Ammonia, Manufacture of. Soc. Anon. Industria Ammoniaca and F. Lopez. April 9, 1930.
350,728. Decomposing ores of zirconium. Deutsche Gasglulicht-Auer-Ges. June 29, 1929.
350,739. Sulphur dioxide, Preparation of. British Thomson-Houston Co., Ltd. June 22, 1929.
350,750. Copper-silicon-zinc alloy. Hirsch Kupfer-und Messingwerke Akt.-Ges. May 27, 1930.
350,775. Copper Alloys. Akt.-Ges. vorm. O. Brandenberger Metallgiesserei U. Hutten Produkte. July 17, 1929.
350,782. Di-substituted tetrazoles, Production of. Knoll Akt.-Ges. Chemische Farbiken. May 20, 1930.
350,828. Roasting and sintering pulverulent ores having a high sulphur content. Metallges Akt.-Ges. September 28, 1929.
350,862. Stable reduction compound of a vat-dyestuff, Manufacture of. W. W. Groves. (*I.G. Farbenindustrie Akt.-Ges.*) October 9, 1930. Addition to 334,878 and 334,919.
350,867. Anhydrides of aliphatic halogen acids, Manufacture of. I.G. Farbenindustrie Akt.-Ges. October 19, 1929.
350,874. Acetic acid, Production of. C. F. Boehringer und Soehne Ges. November 15, 1929.
350,479. Electrolytic manufacture of chlorine. F. S. Low. March 7, 1930.

Applications for Patents

[In the case of applications for patents under the International Convention, the priority date (that is, the original application date abroad which the applicant desires shall be accorded to the patent) is given in brackets, with the name of the country of origin. Specifications of such applications are open to inspection at the Patent Office on the anniversary of the date given in brackets, whether or not they have been accepted.]

Ackroyd, H., and Williams (Hounslow), Ltd. Azo dyestuffs. 18,476. June 26.
Bloxham, A. G. (Soc. of Chemical Industry in Basle). Manufacture of cellulose esters. 18,194. June 23.
Boot's Pure Drug Co., Ltd., and Marshall, J. Production of formaldehyde condensation products. 18,163. June 23.
Botcharsky, S. Fat soluble concentrated vitamins. 18,384. June 25.
British Celanese, Ltd. Treatment of aliphatic acids. 18,443. June 25. (United States, July 11, 1930.)
British Industrial Solvents, Ltd. (Deutsche Gold- und Silber-Scheideanstalt vorm. Roessler). Production of higher alcohols. 18,440. June 25.
Calderbank, A. Apparatus for removing liquids from air and gases. 18,481. June 26.
Callan, T., Imperial Chemical Industries, Ltd., and McGlynn, R. P. Sulphonated vegetable oil products. 18,244. June 24.
Carpmael, A. (I.G. Farbenindustrie Akt.-Ges.). Manufacture of stable derivatives of barbituric acid. 18,308. June 24.
—— Manufacture of complex metal compounds. 18,559. June 26.
—— Manufacture of condensation products of the anthraquinone series. 18,560. June 26.
Chemische Fabrik vorm. Sandoz. Manufacture of antimony compounds. 18,538. June 26. (Germany, July 8, 1930.)
—— Manufacture of antimony compounds. 18,539. June 26. (Germany, July 12, 1930.)
Chemische Fabriken Dr. K. Albert Ges. Production of synthetic resins. 18,159 and 18,160. June 23. (Germany, September 19, 1930.)
—— Production of synthetic resins. 18,161. June 23. (Germany, April 17).
Courtaulds, Ltd., and Wormell, R. L. Manufacture of cellulose compounds. 18,636. June 27.
Crowley, J. F. Manufacture of nitrogen. 18,301. June 24.
Dehn, F. B. (Schwieger Chemical Co.) Manufacture of sugar. 18,166. June 23.
Francis, W., and Imperial Chemical Industries, Ltd. Apparatus for carrying out pyrolysis of gaseous hydrocarbons. 18,182. June 23.
Frischer, H. Recovery of sulphuric acid. 18,091. June 22. (Germany, June 21, 1930.)
Fuchs, O. Production of higher alcohols. 18,270. June 24.
Groves, W. W. (I.G. Farbenindustrie Akt.-Ges.). Manufacture of artificial threads from viscose. 18,049. June 22.
—— Manufacture of azo dyestuffs. 18,272. June 24.
—— Manufacture of artificial silk. 18,415. June 25.
Humboldt-Deutzmotoren Akt.-Ges. Preparation of coal. 18,099. June 22. (Germany, June 20, 1930.)
Hurst, J. E. Cast iron alloys for hardening by nitrogenisation. 18,147. June 23.
Imperial Chemical Industries, Ltd. Manufacture and use of coloured matters. 18,010. June 22.
—— Dyeing processes. 18,243. June 24.
—— Production, etc., of colour lakes. 18,437. June 25.
—— Production of formaldehyde. 18,438. June 25.
—— Production of detergent solutions. 18,513. June 26.
Johnson, J. Y. (I.G. Farbenindustrie Akt.-Ges.). Manufacture of dyestuffs. 18,517. June 26.
Park, J. R., and Sawyer, E. W. Production of formaldehyde. 18,438. June 25.
Produits Chimiques Purs Soc. Anon. Extraction of acids, etc., from aqueous solutions. 18,165. June 23. (France, June 28, 1930.)
Robeson Process Co. Manufacture of condensation products. 18,498. June 26. (United States, August 2, 1930.)
Ruhrchemie Akt.-Ges. Production of mixed salts containing ammoniacal and nitrate-nitrogen jointly. 18,675. June 27. (Germany, July 5, 1930.)
Soc. of Chemical Industry in Basle. Preventing bleeding of dyed textiles on wool. 18,050. June 22. (Switzerland, June 20, 1930.)
Standard Oil Development Co. Recovering alcohols from alkyl sulphates. 18,372. June 25. (United States, August 28, 1930.)
Tennant, W. J. (Victor Chemical Works,) Manufacture of phosphorus oxidation products. 18,175. June 23.
Triggs, W. W. (Brassert-Tidewater Development Corporation). Coking heavy petroleum residues, etc. 18,000. June 22.
—— (Du Pont de Nemours and Co.). Processes of polymerising acetylene. 18,004. June 22.
—— Modification of polymerising non-benzenoid acetylene polymers. 18,509. June 26.
Zotos, G. Refining oils, etc. 18,133. June 23.

Dunstable Portland Cement Co.

Winding-Up Forecast

A CIRCULAR to shareholders of the Dunstable Portland Cement Co., Ltd., which is controlled by Allied Cement Manufacturers, Ltd., states that while the company continues to make profits in excess of the amount required for the payment of the Preference dividend, including that due on July 1 next, the financial position of the company does not justify the payment of that dividend. Since the passing of the dividend on January 1 last, it is recalled, a receiver and manager has been appointed for Allied Cement Manufacturers, Ltd., and the failure of the company to pay its preference dividend is due now, as then, to the inability of the Allied company to discharge its indebtedness.

As already announced, the receiver of the allied company has obtained an offer for the physical assets of that company and of all the companies in the Red Triangle group, including the Dunstable company. If the offer is carried through to completion there will, it is stated, be a liquidation of the company, and when that position arises, the amount available for distribution should permit of the repayment in full of the whole of the preference capital, together with all arrears of dividend.

International Conference on Bituminous Coal

MANY distinguished scientists from Europe will take part in the Third International Conference on Bituminous Coal which is to be held at the Carnegie Institute of Technology, Pittsburgh, U.S.A., November 16 to 21. New developments in fuel technology and utilisation will be explained and discussed. Those interested in coal research may hear such German authorities as Dr. Friedrich Bergius, of Heidelberg, whose process for the hydrogenation of coal has been purchased by the I.G. Farbenindustrie; Dr. Franz Fischer, of the Kaiser-Wilhelm Institut for coal research, whose process for forming liquid hydrocarbons from gases has been widely discussed; and Dr. Ernst Berl, of Darmstadt. Among the English scientists, contributions will be had from Professor William A. Bone, of the Imperial College of Science and Technology, London; Dr. Cecil Lander, director of the Fuel Research Board, who has done much work on low-temperature carbonisation and the utilisation of coal generally; and Dr. R. Lessing, of London. France will be represented by a distinguished group, among whom will be Mailhe and Camille Matignon, of the Sorbonne, Paris; and André Kling, director of the Municipal Laboratory of Paris, who has done outstanding work in producing motor spirits from coal by hydrogenation.

Weekly Prices of British Chemical Products

The prices and comments given below respecting British chemical products are based on direct information supplied by the British manufacturers concerned. Unless otherwise qualified, the figures quoted apply to fair quantities, net and naked at makers' works.

General Heavy Chemicals

ACID ACETIC, 40% TECH.—£18 15s. per ton d/d address U.K. in casks.
ACID CHROMIC.—11d. per lb., less 2½% d/d U.K.
ACID HYDROCHLORIC.—Spot, 3s. 9d. to 6s. carboy d/d, according to purity, strength and locality.
ACID NITRIC, 80° Tw.—Spot, £20 to £25 per ton makers' works, according to district and quality.
ACID SULPHURIC.—Average National prices f.o.r. makers' works, with slight variations up and down owing to local considerations; 140° Tw., Crude acid, 60s. per ton. 168° Tw., Arsenical, £5 10s. per ton. 168° Tw., Non-arsenical, £6 15s. per ton.
AMMONIA (ANHYDROUS).—Spot, 10d. per lb., d/d in cylinders.
AMMONIUM BICHROMATE.—8½d. per lb. d/d U.K., or 8d. c.i.f. export.
BISULPHITE OF LIME.—£7 10s. per ton, f.o.r. London, packages free.
BLEACHING POWDER, 35/37%.—Spot, £7 19s. per ton d/d station in casks, special terms for contracts.
BORAX, COMMERCIAL.—Crystals, £13 10s. per ton; granulated, £12 10s. per ton; powder, £14 per ton. (Packed in 1 cwt. bags. carriage paid any station in Great Britain. Prices quoted are for one ton lots and upwards.)
CALCIUM CHLORIDE (SOLID), 70/75%.—Spot, £4 15s. to £5 5s. per ton d/d station in drums.
CHROMIUM OXIDE.—9d. to 9½d. per lb. according to quantity d/d U.K.
CHROMETAN.—Crystals, 3½d. per lb. Liquor, £18 12s. 6d. per ton d/d U.K.
COPPER SULPHATE.—£25 to £25 10s. per ton.
METHYLATED SPIRIT 61 O.P.—Industrial, 1s. 11d. to 2s. 4d. per gall.; pyridinised industrial, 2s. 1d. to 2s. 6d. per gall.; mineralised, 3s. to 3s. 4d. per gall. 64 O.P., 1d. extra in all cases. Prices according to quantity.
NICKEL SULPHATE.—£38 per ton d/d.
NICKEL AMMONIA SULPHATE.—£38 per ton d/d.
POTASH CAUSTIC.—£30 to £33 per ton.
POTASSIUM BICHROMATE CRYSTALS AND GRANULAR.—4½d. per lb. nett d/d U.K., discount according to quantity: ground ½d. per lb. extra.
POTASSIUM CHLORATE.—3¾d. per lb. ex-wharf, London, in cwt. kegs.
POTASSIUM CHROMATE.—8½d. per lb. d/d U.K., or 8d. c.i.f. export.
SALAMMONIAC.—Firsts lump, spot, £40 17s. 6d. per ton d/d address in barrels. Chloride of ammonia, £37 to £45 per ton, carr. paid.
SALT CAKE, UNGROUND.—Spot, £3 10s. per ton d/d station in bulk.
SODA ASH, 58%.—Spot, £6 per ton, f.o.r. in bags, special terms for contracts.
SODA CAUSTIC, SOLID, 76/77°E.—Spot, £14 10s. per ton, d/d station.
SODA CRYSTALS.—Spot, £5 to £5 5s. per ton, d/d station or ex depot in 2-cwt. bags.
SODIUM ACETATE 97/98%.—£21 per ton.
SODIUM BICARBONATE, REFINED.—Spot, £10 10s. per ton d/d station in bags.
SODIUM BICHROMATE CRYSTALS (CAKE AND POWDER)—3½d. per lb. nett d/d U.K., discount according to quantity. Anhydrous ¾d. per lb. extra.
SODIUM BISULPHITE POWDER, 60/62%.—£16 10s. per ton delivered 1-cwt. iron drums for home trade.
SODIUM CHLORATE.—2¾d. per lb.
SODIUM CHROMATE.—3¾d. per lb. d/d U.K., or 3½d. c.i.f. export.
SODIUM NITRITE.—Spot, £19 per ton, d/d station in drums.
SODIUM PHOSPHATE.—£14 per ton, f.o.r. London, casks free.
SODIUM SILICATE, 140° Tw.—Spot, £8 5s. per ton, d/d station returnable drums.
SODIUM SULPHATE (GLAUBER SALTS).—Spot, £4 2s. 6d. per ton, d/d.
SODIUM SULPHIDE SOLID, 60/62%.—Spot, £10 5s. per ton, d/d in free drums. Crystals—Spot, £8 5s. per ton, d/d in free casks.
SODIUM SULPHITE, PEA CRYSTALS.—Spot, £13 10s. per ton, d/d station in kegs. Commercial—Spot, £9 per ton, d/d station in bags.

Coal Tar Products

ACID CARBOLIC CRYSTALS.—4¾d. to 6¼d. per lb. Crude 60's 1s. to 1s. 1d. per gall. August/December.
ACID CRESYLIC 99/100.—1s. 9d. to 1s. 10d. per gall. B.P., 3s. 6d. per gall. 97/99.—Refined, 2s. 2d. to 2s. 3d. per gall. Pale, 98%, 1s. 7d. to 1s. 8d. Dark, 1s. 4d. to 1s. 4½d.
ANTHRACENE OIL, STRAINED (GREEN OIL).—4½d. to 4¾d. per gall.
BENZOLE.—Prices at works: Crude, 6½d. to 7½d. per gall.; Standard Motor, 1s. 1d. to 1s. 2d. per gall. 90%.—1s. 2d. to 1s. 3d. per gall. Pure, 1s. 5d. to 1s 6d. per gall.
TOLUOLE.—90%, 1s. 8d. to 1s 9d. per gall. Pure, 1s. 10d. to 1s. 11d. per gall.
XYLOL.—1s. 8d. to 1s 9d. per gall. Pure, 1s. 10d to 1s. 11d. per gall.
CREOSOTE.—Standard specification, for export, 5dd. to 5¼d. net per gall. f.o.b.; for Home, 4d. per gall. d/d.
NAPHTHA.—Solvent, 90/160, 1s. 3d. per gall. Solvent, 95/160, 1s. 4d. to 1s. 5d. per gall. Solvent, 90/190, 1s. to 1s. 2d. per gall.
NAPHTHALENE.—Purified Crystals, £10 per ton.
PITCH.—Medium soft, 45s. to 47s. 6d. per ton, in bulk at makers' works.
PYRIDINE.—90/140, 3s. to 3s. 3d. per gall. 90/160, 3s. 3d. to 3s. 6d. per gall. 90/180, 1s. 9d. to 2s. per gall.

Intermediates and Dyes

In the following list of Intermediates delivered prices include packages except where otherwise stated:—

ACID AMIDONAPHTHOL DISULPHO (1-8-2-4).—10s. 9d. per lb.
ACID ANTHRANILIC.—6s. per lb. 100%.
ACID GAMMA.—Spot, 3s. 3d. per lb. 100% d/d buyer's works.
ACID H.—Spot, 2s. 3d. per lb. 100% d/d buyer's works.
ACID NAPHTHIONIC.—1s. 2d. per lb. 100% d/d buyer's works.
ACID NEVILLE AND WINTHER.—Spot, 2s. 6d. per lb. 100% d/d buyer's works.
ACID SULPHANILIC.—Spot, 8½d. per lb. 100% d/d buyer's works.
ANILINE OIL.—Spot, 8d. per lb., drums extra, d/d buyer's works.
ANILINE SALTS.—Spot, 8d. per lb. d/d buyer's works, casks free.
BENZALDEHYDE.—Spot, 1s. 6d. per lb., packages extra, d/d buyer's works.
BENZIDINE BASE.—Spot, 2s. 3d. per lb. 100% d/d buyer's works.
BENZOIC ACID.—Spot, 1s. 8½d. per lb. d/d buyer's works.
o-CRESOL 30/31° C.—£2 6s. 5d. per cwt., in 1-ton lots.
m-CRESOL 98/100%.—2s. 9d. per lb., in ton lots.
p-CRESOL 34·5° C.—1s. 9d. per lb., in ton lots.
DICHLORANILINE.—2s. 5d. per lb.
DIMETHYLANILINE.—Spot, 1s. 6d. per lb., packages extra, d/d buyer's works.
DINITROBENZENE.—7½d. per lb.
DINITROCHLORBENZENE.—£74 per ton d/d.
DINITROTOLUENE.—48/50° C., 7d. per lb.; 66/68° C., 7¾d. per lb.
DIPHENYLAMINE.—Spot, 1s. 8d. per lb. d/d buyer's works.
a-NAPHTHOL.—Spot, 1s. 9d. per lb. d/d buyer's works.
B-NAPHTHOL.—Spot, £65 per ton in 1 ton lots, d/d buyer's works.
a-NAPHTHYLAMINE.—Spot, 10½d. per lb. d/d buyer's works.
B-NAPHTHYLAMINE.—Spot, 2s. 9d. per lb. d/d buyer's works.
o-NITRANILINE.—5s. 11d. per lb.
m-NITRANILINE.—Spot, 2s. 6d. per lb. d/d buyer's works.
p-NITRANILINE.—Spot, 1s. 8d. per lb. d/d buyer's works.
NITROBENZENE.—Spot, 6½d. per lb., 5-cwt. lots, drums extra, d/d buyer's works.
NITRONAPHTHALENE.—8¾d. per lb.
R. SALT.—Spot, 2s. per lb. 100% d/d buyer's works.
SODIUM NAPHTHIONATE.—Spot, 1s. 6d. per lb. 100% d/d buyer's works.
o-TOLUIDINE.—Spot, 8d. per lb., drums extra, d/d buyer's works.
p-TOLUIDINE.—Spot, 1s. 6d. per lb. d/d buyer's works.
m-XYLIDINE ACETATE.—3s. 3d. per lb., 100%.

Wood Distillation Products

ACETATE OF LIME.—Brown, £7 5s. to £7 10s. per ton. Grey, £12 per ton. Liquor, 9d. per gall.
ACETONE.—£63 to £65 per ton.
CHARCOAL.—£6 to £8 10s. per ton, according to grade and locality.
IRON LIQUOR.—24°/30° Tw., 10d. to 1s. 2d. per gall.
RED LIQUOR.—16° Tw., 8½d. to 10d. per gall.
WOOD CREOSOTE.—1s. 9d. per gall., unrefined.
WOOD NAPHTHA, MISCIBLE.—2s. 9d. to 2s. 11s. per gall., according to quantity. Solvent, 3s. 9d. per gall.
WOOD TAR.—£4 to £5 per ton.
BROWN SUGAR OF LEAD.—£32 per ton.

Rubber Chemicals

ANTIMONY SULPHIDE.—Golden, 6d. to 1s. 1d. per lb. according to quality; Crimson, 1s. 3d. to 1s. 5d. per lb., according to quality.
ARSENIC SULPHIDE, YELLOW.—1s. 5d. to 1s. 7d. per lb.
BARYTES.—£6 to £7 10s. per ton, according to quality.
CADMIUM SULPHIDE.—4s. 6d. to 5s. per lb.
CARBON BISULPHIDE.—£26 to £28 per ton, according to quantity; drums extra.
CARBON BLACK.—3d. to 4d. per lb., ex wharf.
CARBON TETRACHLORIDE.—£40 to £50 per ton, according to quantity: drums extra.
CHROMIUM OXIDE, GREEN.—1s. 2d. per lb.
DIPHENYLGUANIDINE.—2s. 6d. per lb.
INDIARUBBER SUBSTITUTES, WHITE.—4⅝d. to 5⅛d. per lb.; Dark, 4⅛d. to 4⅞d. per lb.
LAMP BLACK.—£28 per ton, barrels free.
LITHOPONE, 30%.—£18 to £20 per ton.
SULPHUR.—£9 10s. to £13 per ton, according to quality.
SULPHUR CHLORIDE.—4d. to 7d. per lb., carboys extra.
SULPHUR PRECIP. B.P.—£55 to £60 per ton, according to quantity.
VERMILION, PALE OR DEEP.—6s. 4d. to 6s. 10d. per lb.
ZINC SULPHIDE.—8d. to 11d. per lb.

Pharmaceutical and Photographic Chemicals

ACETANILIDE.—1s. 4½d. to 1s. 6d. per lb.

ACID, ACETIC, PURE, 80%.—£37 5s. per ton d/d address U.K. in casks.

ACID, ACETYL SALICYLIC.—2s. 7d. to 2s. 9d. per lb., according to quantity.

ACID, BENZOIC B.P.—1s. 10d. per lb., for synthetic product. Solely ex Gum, 1s. 3d. to 1s. 6d. per oz.; 50-oz. lots, 1s. 3d. per oz.

ACID, BORIC B.P.—Crystal, £31 per ton; powder, £32 per ton; For one-ton lots and upwards. Packed in 1-cwt. bags carriage paid any station in Great Britain.

ACID, CAMPHORIC.—19s. to 21s. per lb.

ACID, CITRIC.—11½d. per lb., less 5%.

ACID, GALLIC.—2s. 11d. per lb. for pure crystal, in cwt. lots.

ACID, MOLYBDIC.—5s. 3d. per lb. in ¼-cwt. lots. Packages extra. Special prices for quantities and contracts.

ACID, PYROGALLIC, CRYSTALS.—7s. 3d. per lb. for 28-lb. lots.

ACID, SALICYLIC, B.P. PULV.—1s. 5d. to 1s. 8d. per lb. Technical.—1s. to 1s. 2d. per lb.

ACID, TANNIC B.P.—2s. 8d. to 2s. 10d. per lb.

ACID, TARTARIC.—11½d. per lb., less 5%.

AMIDOL.—7s. 6d. to 11s. 3d. per lb., according to quantity.

AMMONIUM BENZOATE.—3s. 6d. per lb.

AMMONIUM CARBONATE B.P.—£36 per ton. Powder, £39 per ton in 5-cwt. casks. Resublimated, 1s. per lb.

AMMONIUM MOLYBDATE.—4s. 9d. per lb. in ¼-cwt. lots. Packages extra. Special prices for quantities and contracts.

ATROPHINE SULPHATE.—7s. to 7s. 6d. per oz., according to quantity.

BARBITONE.—5s. 9d. to 6s. per lb.

BENZONAPHTHOL.—2s. 10d. per lb.

BISMUTH CARBONATE.—7s. 9d. per lb.

BISMUTH CITRATE.—8s. 7d. per lb.

BISMUTH SALICYLATE.—7s. 11d. per lb.

BISMUTH SUBNITRATE.—6s. 9d. per lb.

BISMUTH NITRATE.—Cryst. 5s. 6d. per lb.

BISMUTH OXIDE.—10s. 9d. per lb.

BISMUTH SUBCHLORIDE.—10s. 5d. per lb.

BISMUTH SUBGALLATE.—7s. 9d. per lb. Extra and reduced prices for smaller and larger quantities of all bismuth salts respectively.

BISMUTHI ET AMMON LIQUOR.—Cit. B.P. in W. Qts. 1s. 0½d. per lb.; 12 W. Qts. 11½d. per lb.; 36 W. Qts. 11d. per lb. Liquor Bismuth B.P., in W. Qts., 1s. 2½d. per lb.; 6 W. Qts., 1s. per lb.; 12 W. Qts., 10½d. per lb.; 36 W. Qts., 10d. per lb.

BORAX B.P.—Crystal, £21 10s. per ton; powder, £22 per ton; for one-ton lots and upwards. Packed in 1-cwt. bags carriage paid any station in Great Britain.

BROMIDES.—Ammonium, 1s. 9d. per lb.; potassium, 1s. 4½d. per lb.; granular, 1s. 5d. per lb.; sodium, 1s. 7d. per lb. Prices for 1-cwt. lots.

CAFFEIN, PURE.—6s. 6d. per lb.

CAFFEIN CITRAS.—5s. per lb.

CALCIUM LACTATE.—B.P., 1s. 1½d. to 1s. 3d. per lb., according to quantity.

CAMPHOR.—Refined flowers, 2s. 10d. to 3s. per lb., according to quantity; also special contract prices.

CHLORAL HYDRATE.—2s. 11½d. to 3s. 1½d. per lb.

CHLOROFORM.—2s. 3d. to 2s. 6d. per lb., according to quantity.

ETHERS.—S.G. ·730—1s. 1d. to 1s. 2d. per lb., according to quantity; other gravities at proportionate prices.

FORMALDEHYDE, 40%.—30s. per cwt., in barrels, ex wharf.

GLUCOSE, MEDICINAL.—1s. 6d. to 2s. per lb. for large quantities.

HEXAMINE.—1s. 10d. to 2s. per lb., according to quantity.

HYDROGEN PEROXIDE (12 VOLS.).—1s. 4d. per gallon, f.o.r. makers' works, naked. B.P., 10 vols., 2s. to 2s. 3d. per gall.; 20 vols., 3s. per gall.

HYDROQUINONE.—3s. 9d. to 4s. per lb., in cwt. lots.

HYPOPHOSPHITES.—Calcium, 2s. 11d. to 3s. 4d. per lb.; potassium, 3s. 2d. to 3s. 7d. per lb.; sodium, 3s. 1d. to 3s. 6d. per lb.; for 28-lb. lots.

IRON AMMONIUM CITRATE.—B.P., 1s. 9d. per lb., for 28-lb. lots. Green, 2s. 6d. per lb., list price. U.S.P., 2s. 7d. per lb. list price.

IRON PERCHLORIDE.—18s. to 20s. per cwt., according to quantity.

IRON QUININE CITRATE.—B.P., 8½d. to 8¾d. per oz.

MAGNESIUM CARBONATE.—Light B.P., 36s. per cwt.

MAGNESIUM OXIDE.—Light Commercial, £62 10s. per ton, less 2½%; Heavy commercial, £21 per ton, less 2½%; in quantity lower; Heavy Pure, 2s. to 2s. 3d. per lb.

MENTHOL.—A.B.R. recrystallised B.P., 14s. 6d. per lb. net; Synthetic, 8s. 6d. to 12s. per lb.; Synthetic detached crystals, 8s. 6d. to 10s. per lb., according to quantity; Liquid (95%), 9s. per lb.

MERCURIALS B.P.—Up to 1-cwt. lots, Red Oxide, crystals, 8s. 4d. to 8s. 5d. per lb., levig., 7s. 10d. to 7s. 11d. per lb.; Corrosive Sublimate, Lump, 6s. 7d. to 6s. 8d. per lb., Powder, 6s. to 6s. 1d. per lb.; White Precipitate, Lump, 6s. 9d. to 6s. 10d. per lb., Powder, 6s. 10d. to 6s. 11d. per lb., Extra Fine, 6s. 11d. to 7s. per lb.; Calomel, 7s. 2d. to 7s. 3d. per lb.; Yellow Oxide, 7s. 8d. to 7s. 9d. per lb.; Persulph, B.P.C., 6s. 11d. to 7s. per lb.; Sulph. nig., 6s. 8d. to 6s. 9d. per lb. Special prices for larger quantities.

METHYL SALICYLATE.—1s. 3d. to 1s. 5d. per lb.

PARAFORMALDEHYDE.—1s. 6d. per lb.

PARALDEHYDE.—1s. 1d. per lb.

PHENACETIN.—3s. 9d. to 4s. 1d. per lb.

PHENOLPHTHALEIN.—5s. to 5s. 2½d. per lb.

POTASSIUM BITARTRATE 99/100% (Cream of Tartar).—81s. per cwt., less 2½ per cent.

POTASSIUM CITRATE.—B.P., 1s. 7d. per lb. for 28-lb. lots.

POTASSIUM FERRICYANIDE.—1s. 7½d. per lb., in 125-lb. kegs.

POTASSIUM IODIDE.—16s. 8d. to 17s. 9d. per lb., as to quantity.

POTASSIUM METABISULPHITE.—50s. per cwt. d/dLondon, kegs free.

POTASSIUM PERMANGANATE.—B.P. crystals, 5½d. per lb., spot.

QUININE SULPHATE.—1s. 8d. per oz. for 1,000-oz. lots.

SACCHARIN.—43s. 6d. per lb.

SALICIN.—16s. 6d. to 17s. 6d. per lb., according to quantity.

SILVER NITRATE.—10d. per oz. for 500-oz. lots, sticks, 2d. per oz. extra.

SODIUM BARBITONUM.—8s. 6d. to 9s. per lb. for 1-cwt. lots.

SODIUM BENZOATE B.P.—1s. 6½d. to 1s. 7½d. per lb.

SODIUM CITRATE.—B.P.C. 1911, 1s. 4d. per lb. B.P.C. 1923, and U.S.P., 1s. 8d. per lb. for 28-lb. lots.

SODIUM HYPOSULPHITE, PHOTOGRAPHIC.—£15 per ton, d/d consignee's station in 1-cwt. kegs.

SODIUM NITROPRUSSIDE.—16s. per lb.

SODIUM POTASSIUM TARTRATE (ROCHELLE SALT).—75s. per cwt. net, ton lots, d/s of 5 cwt. Crystals, 2s. 6d. per cwt. extra.

SODIUM SALICYLATE.—Powder, 1s. 10d. to 2s. 2d. per lb. Crystal, 1s. 11d. to 2s. 3d. per lb.

SODIUM SULPHIDE, PURE RECRYSTALLISED.—10d. to 1s. 2d. per lb.

SODIUM SULPHITE, ANHYDROUS.—£26 to £28 per ton, according to quantity. Delivered U.K.

STRYCHNINE, ALKALOID CRYSTAL, 2s. per oz.; hydrochloride, 1s. 9½d. per oz.; nitrate, 1s. 8d. per oz.; sulphate, 1s. 9d. per oz., for 1,000-oz. quantities.

TARTAR EMETIC, B.P.—Crystal or powder, 1s. 9d. to 2s. per lb.

THYMOL.—Puriss, 6s. 1½d. to 7s. per lb., according to quantity. Natural, 12s. per lb.

ZINC STEARATE.—1s. 4d. to 1s. 6d. per lb.

Perfumery Chemicals

ACETOPHENONE.—7s. per lb.

AUBEPINE (EX ANETHOL).—9s. per lb.

AMYL ACETATE.—2s. 3d. per lb.

AMYL BUTYRATE.—4s. 9d. per lb.

AMYL CINNAMIC ALDEHYDE.—9s. per lb.

AMYL SALICYLATE.—2s. 6d. per lb.

ANETHOL (M.P. 21/22° C.).—5s. per lb.

BENZALDEHYDE FREE FROM CHLORINE.—2s. 6d. per lb.

BENZYL ACETATE FROM CHLORINE-FREE ALCOHOL.—1s. 9d. per lb.

BENZYL ALCOHOL FREE FROM CHLORINE.—1s. 9d. per lb.

BENZYL BENZOATE.—2s. 2d. per lb.

CINNAMIC ALDEHYDE NATURAL.—11s. 9d. per lb.

COUMARIN.—12s. per lb.

CITRONELLOL.—6s. 6d. per lb.

CITRAL.—6s. 6d. per lb.

ETHYL CINNAMATE.—6s. 9d. per lb.

ETHYL PHTHALATE.—2s. 6d. per lb.

EUGENOL.—8s. 6d. per lb.

GERANIOL.—6s. to 10s. per lb.

HELIOTROPINE.—5s. 6d. per lb.

ISO EUGENOL.—10s. 6d. per lb.

LINALYL ACETATE, EX BOIS DE ROSE.—7s. 6d. per lb. Ex Shui Oil, 7s. 6d. per lb.

METHYL ANTHRANILATE.—6s. 3d. per lb.

METHYL BENZOATE.—4s. 3d. per lb.

MUSK XYLOL.—6s. 6d. per lb.

PHENYL ETHYL ACETATE.—10s. per lb.

PHENYL ETHYL ALCOHOL.—8s. 3d. per lb.

RHODINOL.—40s. per lb.

SAFROL—1s. 6d. per lb.

VANILLIN, EX CLOVE OIL.—14s. 6d. to 16s. 6d. per lb. Ex Guaiacol.—13s. to 15s. per lb.

Essential Oils

ANISE OIL.—2s. 6d. per lb.

BERGAMOT OIL.—7s. 9d. per lb.

BOURBON GERANIUM OIL.—17s. 6d. per lb.

CAMPHOR OIL.—White, 2s. per lb.; Brown, 1s. 6d. per lb.

CANANGA.—Java, 8s. per lb.

CINNAMON OIL LEAF.—4s. per oz.

CITRONELLA OIL.—Java, 2s. 3d. per lb., c.i.f. Pure Ceylon, 2s. per lb.

CLOVE OIL, 90/92%.—6s. 6d. per lb.

EUCALYPTUS OIL, AUSTRALIAN, B.P. 70/75%—1s. 5d. per lb.

LAVENDER OIL.—Mont Blanc, 38/40%, 9s. per lb.

LEMON OIL.—4s. per lb.

LEMONGRASS OIL.—3s. per lb.

ORANGE, SWEET.—8s. per lb.

OTTO OF ROSE.—Anatolian, 45s. per oz.; Bulgarian, 65s. per oz.

PALMA ROSA.—9s. 6d. per lb.

PEPPERMINT OIL.—Wayne County, 8s. 6d. per lb.; Japanese, 5s. per lb.; Petit grain, 6s. per lb.

London Chemical Market

The following notes on the London Chemical Market are specially supplied to* THE CHEMICAL AGE *by Messrs. R. W. Greeff & Co., Ltd., and Messrs. Chas. Page & Co., Ltd., and may be accepted as representing these firms' independent and impartial opinions.

London, July 2, 1931.

ENQUIRIES during the current week have shown a considerable improvement, and prices generally are firm.

General Chemicals

ACETONE.—In regular request at £60 to £63 per ton, according to quantity.

ACID ACETIC.—Unchanged at £36 5s. to £38 5s. per ton for technical 80% and £37 5s. to £39 5s. per ton for pure 80%, with a good steady demand.

ACID CITRIC.—Still somewhat slow at 1s. per lb., less 5%.

ACID FORMIC.—£38 per ton and in good request.

ACID OXALIC.—£34 per ton, carriage paid in and steady request.

ACID TARTARIC.—A little easier at about 11d. per lb., less 5%, with an increasing demand.

ALUMINA SULPHATE.—£7 15s. to £8 5s. per ton for 17/18% iron free quality.

ARSENIC.—Continues firm at £19 to £19 10s. per ton.

CREAM OF TARTAR.—In steady request at about 80s. per cwt., ex warehouse London.

COPPER SULPHATE.—Firm, with price nominal at £21 to £21 10s. per ton, less 5%, free on rails London.

FORMALDEHYDE.—In steady request at about £28 per ton.

LEAD ACETATE.—White at £31 15s. per ton,, brown £1 per ton less, with a steady demand.

LITHOPONE.—£18 to £22 per ton according to grade and quantity, and the active demand continues.

POTASSIUM BICHROMATE.—4¼d. per lb., with discounts for contracts.

POTASSIUM CHLORATE.—£28 to £32 per ton according to grade and quantity and in active demand.

PERMANGANATE OF POTASH.—Continues firm at 5¼d. to 5½d. per lb., ex warehouse for B.P. needle crystals.

SODIUM BICHROMATE.—Firm at 3½d. per lb., with discounts for contracts and in regular request.

SODIUM HYPOSULPHITE PHOTOGRAPHIC CRYSTALS.—£14 5s. per ton, and in regular demand. Commercial about £8 10s. per ton.

SODIUM PRUSSIATE.—Unchanged at 4¾d. to 5¼d. per lb., and in steady request.

TARTAR EMETIC.—Rather quiet at 10½d. per lb.

ZINC SULPHATE.—Unchanged at £10 10s. per ton.

Coal Tar Products

THE market for coal tar products still remains dull, with very little enquiry, although prices remain unaltered.

MOTOR BENZOL.—Worth about 1s. 4½d. to 1s. 5½d. per gallon, f.o.r.

SOLVENT NAPHTHA.—Quoted at about 1s. 1½d. to 1s. 2d. per gallon, f.o.r.

HEAVY NAPHTHA.—Remains at about 11d. to 1s. 0½d. per gallon f.o.r.

CREOSOTE OIL.—Unchanged at about 3d. to 3½d. per gallon f.o.r. in the North, and at 4d. to 4½d. per gallon in London.

CRESYLIC ACID.—Obtainable at about 1s. 8d. per gallon for the 98/100% quality, and at about 1s. 6d. per gallon for the dark quality 95/97%.

NAPHTHALENES.—Quoted at about £3 10s. to £3 15s. per ton for the firelighter quality, at about £4 to £4 5s. per ton for the 74/76 quality, and at about £5 per ton for the 76/78 quality.

PITCH.—Obtainable at 40s. to 42s. 6d. per ton, f.o.b. East Coast Port, for forward delivery.

Nitrogen Fertilisers

Sulphate of Ammonia.—Export.—Business in this product is still at a standstill pending the announcement of prices for the new season. Buyers are hopeful that prices will be lower. *Home.*—There is very little interest except from a few fertiliser manufacturers who wish to commence operations early in the year. Until new prices have been announced, producers will continue offering at the February/June price.

Nitrate of Soda.—It is announced in the press that for the month of July the prices will be the same as for March/June.

Latest Oil Prices

LONDON.—LINSEED OIL was quiet at 2s. 6d. to 7s. 6d. per ton decline. Spot, ex mill, £18 15s.; July, £16 15s.; July-August, £16 17s. 6d.; September-December, £17 5s.; and January-April, £17 17s. 6d. naked. RAPE OIL was firm, and 10s. higher. Crude, extracted, £27 and technical refined, £28 10s., naked, ex wharf. COTTON OIL was firm at 10s. advance. Egyptian crude, £20 10s.; refined common edible, £23 10s.; and deodorised, £25 10s., naked, ex mill. TURPENTINE was quiet. American, spot, 47s.; August-December, 47s. 3d. per cwt.

HULL, July 1.—LINSEED OIL.—Spot quoted £17 15s.; July to December, £17 12s. 6d.; January-April, £18 per ton. naked. COTTON OIL.—Egyptian, crude, spot, £20 10s.; technical, spot, £22; edible, refined, spot, £22 10s.; deodorised, £24 10s. per ton; Bombay, crude, spot, unquoted. PALM KERNEL OIL.—Crude, f.m.q., spot, £21 10s. per ton, naked. GROUNDNUT OIL.—Crushed-extracted, spot, £24 10s.; deodorised, £28 10s, per ton. SOYA OIL.—Crushed extracted, spot, £18; deodorised, £21 10s. per ton. RAPE OIL.—Crushed-extracted, spot, £26; refined, £28 per ton. CASTOR OIL.—Pharmacy, spot, 40s. 6d. per cwt.; first, 35s. 6d.; second, 33s. 6d. COD OIL, 18s. per cwt. TURPENTINE, 49s. 3d. per cwt.

South Wales By-Products

THERE is scarcely any change in South Wales by-product activities. The call for pitch continues to be sporadic and unsatisfactory, most of the big users, especially the patent fuel makers, confining their buying to small prompt parcels. There is no change in values. Road tar has a fair and steady call round about 13s. per 40-gallon barrel. Refined tars have a quiet market, with values unchanged for coke-oven and gasworks tar. Naphthas have a decidedly slow market, there only being a small call for solvent and practically no call for heavy. Patent fuel and coke exports are slightly better, but are still far from satisfactory. Patent fuel prices, for export, are as follows: 20s. to 20s. 6d., ex-ship Cardiff; 19s. to 19s. 6d., ex-ship Swansea. Coke prices are: Best foundry, 34s. to 36s. 6d.; good foundry, 22s. 6d. to 25s.; furnace, 16s. 6d. to 17s. 6d.

Scottish Coal Tar Products

A CERTAIN amount of business is being transacted in the higher boiling fractions of cresylic acid and prices are firmer. Ordinary cresylics remain dull, however. Creosote is also in fair request for home delivery, but other products are uninteresting.

Cresylic Acid.—Ordinary grades are quiet with quotations irregular. Pale 99/100%, 1s. 5d. to 1s. 6d. per gallon; pale, 97/99%, 1s. 3d. to 1s. 4d. per gallon; dark, 97/99 %, 1s. 2d. to 1s. 3d. per gallon; high boiling is scarce and firmer at 2s. to 2s. 3d. per gallon, all f.o.r. naked.

Carbolic Sixties.—Few inquiries are being received and price is nominal at 1s. 1d. to 1s. 3d. per gallon f.o.r. in bulk.

Creosote Oil.—Supplies of the best grades are not plentiful and prices are steady. Specification oils, 2¼d. to 3d. per gallon; gas works ordinary 3½d. to 3¾d per gallon, washed oil, 3¼d. to 3½d. per gallon; all f.o.r. in bulk.

Coal Tar Pitch.—While inquiries for delivery next season are quite plentiful, little business is reported. Export value is 40s. to 42s. 6d. per ton f.o.b. Glasgow, and home price is 35s. to 37s. 6d. per ton, ex works.

Blast Furnace Pitch.—Controlled prices remain at 30s. per ton f.o.r. works for home trade, and 35s. per ton f.a.s. Glasgow for export.

Refined Coal Tar.—Output is well maintained but value remains easy at 2¼d. to 2¾d. per gallon f.o.r. in buyers' packages.

Crude Naphtha.—Value remains steady at 4¼d. to 5¼d. per gallon, according to quality.

Water White Products.—Business is slow and quotations are irregular. Motor benzol is about 1s. 4d. to 1s. 5d. per gallon; 90/160, solvent, 1s. 3d. to 1s. 4d. per gallon; 90/190 heavy solvent, 1s. 1d. to 1s. 2d. per gallon; all f.o.r. in bulk quantities.

A New Non-Corrodible Acid-Resisting Alloy

BATTERIUM metal, a new copper-aluminium-nickel alloy, introduced by Batterium Metal and Vislock, Ltd., of Market Harborough, is claimed to be an ideal acid-resisting metal for the construction of stills, fractionating columns, solvent extraction and solvent recovery plant, and also for chemical plant generally. It is suitable for use in contact with organic acids, alkalies, superheated steam, and bleaching and dyeing liquids. Particulars of tests on the action of various corrosive liquids towards this metal are contained in a leaflet which has been issued by the makers. These tests were carried out at the Royal Technical College, Salford, alongside Monel metal, Staybrite steel, and electrolytic copper as materials providing a standard of comparison.

Scottish Chemical Market

The following notes on the Scottish Chemical Market are specially supplied to THE CHEMICAL AGE by Messrs. Charles Tennant and Co., Ltd., Glasgow, and may be accepted as representing this firm's independent and impartial opinions.

Glasgow, June 30, 1931.

No important changes have taken place in the Scottish heavy chemical market. Prices still remain steady.

Industrial Chemicals

ACETONE.—B.G.S.—£60 to £63 per ton, ex wharf, according to quantity.

ACID, ACETIC.—Prices ruling are as follows: glacial, 98/100%, £47 to £58 per ton; pure, £37 5s. per ton; technical, 80%, £36 5s., delivered in minimum lots of 1 ton.

ACID, BORIC.—Granulated commercial, £22 per ton; crystals, £23 per ton; B.P. crystals, £31 per ton; B.P. powder, £32 per ton, in 1-cwt. bags, delivered Great Britain free in one-ton lots upwards.

ACID, HYDROCHLORIC.—Usual steady demand. Arsenical quality, 4s. per carboy. Dearsenicated quality, 5s. per carboy, ex works, full wagon loads.

ACID, NITRIC, 80° QUALITY.—£23 per ton, ex station, full truck loads.

ACID, OXALIC.—98/100%.—On offer at 3¼d. per lb., ex store. On offer from the Continent at 3¼d. per lb., ex wharf.

ACID, SULPHURIC.—£3 7s. 6d. per ton, ex works, for 144° quality, £5 15s. per ton for 168°. Dearsenicated quality, 20s. per ton extra.

ACID, TARTARIC, B.P. CRYSTALS.—Quoted 1s. per lb., less 5%, ex wharf. On offer for prompt delivery from the Continent at 11¾d. per lb., less 5%, ex wharf.

ALUMINA SULPHATE.—Quoted round about £8 10s. per ton, ex store.

ALUM, LUMP POTASH.—Now quoted £8 10s. per ton., c.i.f. U.K. ports. Crystal meal, about 2s. 6d. per ton less.

AMMONIA ANHYDROUS.—Quoted 10½d. per lb., containers extra and returnable.

AMMONIA CARBONATE.—Lump quality quoted £36 per ton. Powdered, £38 per ton, packed in 5 cwt. casks, delivered U.K. stations or f.o.b. U.K. ports.

AMMONIA LIQUID, 80°.—Unchanged at about 2½d. to 3d. per lb., delivered, according to quantity.

AMMONIA MURIATE.—Grey galvanisers' crystals of British manufacture quoted £21 to £22 per ton, ex station. Fine white crystals offered from the Continent at about £17 5s. per ton, c.i.f. U.K. ports.

ANTIMONY OXIDE.—Spot material obtainable at round about £24 per ton, ex wharf. On offer for shipment from China at about £22 per ton, c.i.f. U.K.

ARSENIC, WHITE POWDERED.—Quoted £22 10s. per ton, ex wharf Spot material still on offer at £22 15s. per ton, ex store.

BARIUM CHLORIDE.—In good demand and price about £9 10s. per ton, c.i.f. U.K. ports. For Continental materials our price would be £8 10s. per ton, f.o.b. Antwerp or Rotterdam.

BLEACHING POWDER.—British manufacturers' contract price to consumers unchanged at £6 15s. per ton, delivered in minimum 4-ton lots. Continental now offered at about the same figure.

CALCIUM CHLORIDE.—Remains unchanged. British manufacturers' price, £4 15s. to £5 5s. per ton, according to quantity and point of delivery. Continental material on offer at £4 7s. 6d. per ton, c.i.f. U.K. ports.

COPPERAS, GREEN.—At about £3 15s. per ton, f.o.r. works, or £4 12s. 6d. per ton, f.o.b. U.K. ports.

FORMALDEHYDE, 40%.—Now quoted £29 per ton, ex store. Continental on offer at about £27 per ton, ex wharf.

GLAUBER SALTS.—English material quoted £4 10s. per ton, ex station. Continental on offer at about £3 per ton, ex wharf.

LEAD, RED.—Price now £30 per ton, delivered buyers' works.

LEAD, WHITE.—Quoted £38 per ton, carriage paid.

LEAD ACETATE.—White crystals quoted round about £32 to £34 per ton c.i.f. U.K. ports. Brown on offer at about £1 per ton less.

MAGNESITE, GROUND CALCINED.—Quoted £9 10s. per ton. ex store.

METHYLATED SPIRIT.—Industrial quality 64 o.p. quoted 1s. 8d. per gallon, less 2½% delivered.

POTASSIUM BICHROMATE.—Quoted 4¼d. per lb., delivered U.K. or c.i.f. Irish ports, with an allowance for contracts.

POTASSIUM CARBONATE.—Spot material on offer, £25 10s. per ton ex store. Offered from the Continent at £24 15s. per ton, c.i.f. U.K. ports.

POTASSIUM CHLORATE, 99½/100% POWDER.—Quoted £26 15s. per ton ex store; crystals 30s. per ton extra.

POTASSIUM NITRATE.—Refined granulated quality quoted £20 17s. 6d. per ton, c i.f. U.K. ports. Spot material on offer at about £20 10s. per ton ex store.

POTASSIUM PERMANGANATE B.P. CRYSTALS.—Quoted 5¼d. per lb., ex wharf.

POTASSIUM PRUSSIATE (YELLOW).—Spot material quoted 7d. per lb. ex store. Offered for prompt delivery from the Continent at about 6¾d. per lb. ex wharf

SODA CAUSTIC.—Powdered 98/99%, £17 10s. per ton in drums, £18 15s. in casks. Solid 76/77% £14 10s. per ton in drums, £14 12s. 6d. per ton for 70/72% in drums; all carriage paid buyer's station, minimum four-ton lots; for contracts 10s. per ton less.

SODIUM BICARBONATE.—Refined recrystallised, £10 10s. per ton, ex quay or station. M.W. quality 30s. per ton less.

SODIUM BICHROMATE.—Quoted 3¾d. per lb., delivered buyer's premises, with concession for contracts.

SODIUM CARBONATE (SODA CRYSTALS).—£5 to £5 5s. per ton, ex quay or station; powdered or pea quality, 7s. 6d. per ton extra: Light soda ash, £7 13s. per ton, ex quay, minimum four-ton lots, with various reductions for contracts.

SODIUM HYPOSULPHITE.—Large crystals of English manufacture quoted £9 2s. 6d. per ton, ex station, minimum four-ton lots. Pea crystals on offer at £15 per ton, ex station, minimum four-ton lots.

SODIUM NITRATE.—Chilean producers now offer at £10 per ton, carriage paid, buyer's sidings, minimum six-ton lots.

SODIUM PRUSSIATE.—Quoted 5¼d. per lb., ex store. On offer at 5d. per lb., ex wharf, to come forward.

SODIUM SULPHATE (SALTCAKE).—Price, 60s. per ton, ex works; 65s. per ton, delivered, for unground quality. Ground quality 2s. 6d. per ton extra.

SODIUM SULPHIDE.—Prices for home consumption: solid 61/62%, £10 per ton; broken, 60/62%, £11 per ton; crystals 30/32%, £8 2s. 6d. per ton, delivered buyers' works on contract, minimum four-ton lots. Special prices for some consumers. Spot material 5s. per ton extra.

SULPHUR.—Flowers, £12 per ton; roll, £10 10s. per ton; rock, £9 5s. per ton; ground American, £8 10s. per ton, ex store.

ZINC CHLORIDE 98%.—British material now offered at round about £18 10s. per ton, f.o.b. U.K. ports.

ZINC SULPHATE.—Quoted £11 per ton, ex wharf.

NOTE.—The above prices are for bulk business and are not to be taken as applicable to small parcels.

Alkali in Western Canada

Utilisation of Natural Deposits of Sodium Sulphate

THERE was a five-fold increase last year in the production of sodium sulphate derived from the natural alkali lakes of the Prairie Provinces in Western Canada. In 1929, about 5,018 tons of this material were taken from the lakes, but last year production rose to 31,571 tons. This large increase in the output of the anhydrous sodium sulphate (salt cake) is attributable to the demands made by the International Nickel Co. for its smelter plant at Copper Cliff, Ontario, as well as to increased consumption by sulphate-pulp mills. The pulp mills use the natural salt cake, but the material utilised by the International Nickel Co. is treated with sulphuric acid to make acid sodium sulphate, or nitre cake, for use in the metallurgical process for the separation of copper and nickel.

In 1929 about 80,900 tons of nitre cake were imported into Canada for use in nickel refining. The preparation of this quantity from the anhydrous salts of western Canada would necessitate an output of over 45,000 tons from the deposits. Deliveries to Copper Cliff did not begin until June, 1930, but this year a greatly increased production is anticipated. The pulp and paper industry consumed, in 1929, about 44,882 tons of salt cake, and the ability of the western Canadian natural deposits to supply the requirements of the copper-nickel industry, as well as of the pulp and paper industry, is shown by the figure of 120 million tons estimated by the Dominion Department of Mines as the weight of the hydrous salts in the proven deposits.

Price Increase for Bismuth Salts

AN advance in the prices of bismuth salts, amounting to 6d. per lb. on carbonate with corresponding differences on other salts, is announced by May and Baker, Ltd., of Battersea London, S.W.11. The following prices now apply for quantities of not less than 1 cwt.:—

Bismuth	Carbonate	7s. 9d. per lb.
,,	Citrate	8s. 7d. ,,
,,	Nitrate Cryst	5s. 6d. ,,
,,	Oxide	10s. 9d. ,,
,,	Salicylate	7s 11d. ,,
,,	Subchloride	10s. 5d. ,,
,,	Subgallate	7s. 9d. ,,
,,	Subnitrate	6s. 9d. ,,

A rebate of 3d. per lb. will be allowed on sales of not less than two cwts. (for prompt delivery or on contract) provided delivery is completed or paid for within three months.

Manchester Chemical Market

(From Our Own Correspondent.)

Manchester, July 2, 1931.

In spite of the recent upward movement of the metal a further reduction in certain lead products has been put into operation, and this seems to be about the only section of the market for any notable weakness to develop during the past week. Most other lines remain on a steady to firm basis, with business on a moderate scale. The complete stoppage of various Lancashire industrial towns for the annual holidays naturally has a quieting influence on the chemical trade, in common with most others, but in spite of this reports this week point to a slight improvement in cotton trade conditions, with a fair call for textile chemicals generally.

Heavy Chemicals

The demand for sulphide of sodium during the past few days has been rather subdued, but values are much the same as before, the commercial product being on offer at round £7 15s. per ton, and the 60-65 per cent. concentrated solid quality at about £9. There is a moderate movement in the case of saltcake, and prices are steady at up to £3 per ton. Caustic soda continues to be called for in fair quantities and contract quotations are firm at from £12 15s. to £14 per ton, according to grade. A quiet business is passing in the case of diphosphate of soda, which seems reasonably steady at the moment at £10 to £10 10s. per ton. Hyposulphite of soda is steady and in moderate request, with the photographic material quoted at about £15 5s. per ton and the commercial at £9 to £9 5s. Bicarbonate of soda meets with a fair amount of attention and offers are quite firm at £10 10s. per ton. A quietly steady demand is about in the case of bichromate of soda and values are maintained at 3½d. per lb., less 1 to 2½ per cent. Prussiate of soda is steady and in moderate inquiry at from 4¾d. to 5¼d. per lb., according to quantity. Alkali continues to be quoted at round £6 per ton, and a fair trade is reported. There is not much doing in the case of chlorate of soda, but there has been no change in the price situation, current values of the material being at about £26 10s. per ton.

Enquiry for caustic potash is on quiet lines, with prices ranging this week at from about £27 to £28 per ton. A slow business is passing in permanganate of potash but offers are fairly steady at 5½d. per lb. for the B.P. grade and round 5d. for the commercial. A moderate amount of buying interest is being shown in yellow prussiate of potash, which keeps firm at from 6¾d. to 7¼d. per lb., according to quantity. Carbonate of potash continues to be offered at up to £24 10s. per ton, a quiet trade being done. Chlorate of potash is not in particularly brisk demand but prices in this section have been maintained at £27 10s. per ton. There is a moderate call for bichromate of potash, which is quoted on the basis of 4¼d. per lb., less discounts of from 1 to 2½ per cent., according to quantity.

The demand for sulphate of copper is still relatively quiet but there has been little further price change in one direction or the other, about £18 10s. per ton, f.o.b., being quoted. Arsenic continues firm at £19 10s. per ton at the mines for white powdered, Cornish makes, and current offers of this material are not too plentiful. The lead compounds are quoted at about £28 10s. per ton for the nitrate and £32 and £31 per ton for the white and brown acetates. Sales of the acetates of lime are of moderate extent, with the brown quality on offer at from £7 5s. to £7 10s. per ton, and the grey at round £12.

Acids and Tar Products

Tartaric acid maintains its recent price level, a quiet business being put through at about 11½d. per lb. Citric acid is attracting some attention, with offers going up to 1s. per lb. Oxalic acid is moving in moderate quantities and prices are firm at round £1 14s. per cwt., ex store. Acetic acid is well held at £51 per ton for the technical glacial quality and £37 for the commercial 80 per cent.

Quiet forward bookings of pitch have been reported this week at about 40s. per ton, f.o.b. Creosote oil is only in comparatively limited request, with prices at from 3d. to 4d. per gallon, naked, according to grade. Carbolic acid is featureless at the moment, with crystals at about 5¼d. per lb. and crude 60's at 1s. 2d. per gallon, naked. Solvent naphtha is unchanged at 1s. 2d. per gallon, with the demand quiet.

Company News

Boots Pure Drug Co.—A quarterly interim dividend at the rate of 24 per cent. per annum, less tax, payable July 1 has been declared by the directors. This is unchanged on previous payments.

British Feeding Meals and Milk Products Co.—Reductions of capital from £500,000 to £307,362 were recently confirmed by the High Court of Justice (Chancery Division) and registered by the Registrar of Joint Stock Companies.

Royal Dutch Petroleum.—Final dividends of Fls. 70 per ordinary share and Fls. 7 per sub-share. On presentation of coupon No. 70 payment will be made on or after July 8, at N. M. Rothschild and Sons, New Court, St. Swithin's Lane, London, E.C.4.

Lonza Electricity and Chemical.—Net profits to March 31, including balance brought in, was Frs.2,986,369 (against Frs.5,291,289). Dividend of 5 per cent. (against 8 per cent.) on ordinary capital of Frs.48,000,000; reserve increased to Frs. 3,650,000.

American Smelting and Refining Co.—A halving of the usual dividend rate is announced. The directors recommend a quarterly dividend of 50 cents per Common share, payable on August 1 to holders of record July 10, thus instituting a $2 annual rate, against $4 previously.

Horace Cory.—The directors of Horace Cory and Co., Ltd., chemical colour manufacturers, state that, although much progress has been made with dry lithographic ink, they have decided not to pay interim dividend on Ordinary shares. The last Ordinary dividend was 2½ per cent. in 1929.

Dutch Artificial Silk.—The accounts for the year 1930, of the Dutch Artificial Silk Industry, which are now available, show a gross profit, including the undivided balance, of Fls.2,673,071, and a profit of Fls.1,400,171. The board has fixed depreciations at Fls.1,399,150, and propose to carry forward the balance of Fls.1,021.

Lincolnshire Sugar.—Report for year ended March 31, states that profit, after providing for expenses of management, was £56,005 (against £73,613), from which has been deducted Debenture loan interest £7,712, leaving £48,292. Provision has been made as follows: Depreciation reserve £16,000 (£16,200), special reserve £8,000, income tax reserve £11,000, leaving net profit of £13,292; add balance brought forward £31,104, making balance to be carried forward of £44,397.

Zinc Corporation, Ltd.—The accounts for 1930 show a loss on mining operations of £41,874, against a profit of £137,156 in the previous year. It is stated that had the past year's production been realised on the basis of 1929 prices, revenue would have exceeded that of the previous period by more than £400,000. Interest, dividends and sundry revenue amounted to £113,787, against £124,830, and the net profit was £68,381, a drop of £177,669 on the figure of 1929. The year's dividends —23¾ per cent. on the Preference and 7½ per cent. on the Ordinary, the latter being paid as an interim—absorbed £82,844, as compared with £206,434 previously, when the Preference received 37½ per cent. and the Ordinary 35 per cent. After allowing £19,081, against £21,509, for mine development and new plant, there is £26,585 to go forward, less than half the amount brought in.

Whitehead Iron and Steel Co.—Net profit for the year to March 31, 1931, amounted to £23,567, as compared with £41,150 in the year to March 31, 1930. An interim dividend of 5 per cent. was paid in December, but it is not proposed to make any further distribution in respect of the period just ended. Last year 10 per cent. was paid in equal instalments. The general reserve is increased to £50,000 by the transfer of £12,000. The report states that the directors have decided to close the Tredegar works for the time being, and concentrate the whole output on the more modern plant at the Newport works, and in doing so it is estimated that a saving of over £30,000 a year will be effected in operating costs, transport and other charges. An extraordinary general meeting will be held immediately after the annual general meeting, when shareholders will be asked to authorise the issue of £100,000 7½ per cent. Convertible Debentures to meet the balance of the capital expenditure on the new mill and to provide for additional working capital for the increased productive capacity of the new plant.

New Companies Registered

MEALOL CO., LTD., 133, Moorgate, London, E.C.2.—Registered June 29. Capital, £500 in £1 shares. Manufacturers and dealers in medical, chemical, pharmaceutical and other industrial preparations. Directors: W. J. Stokes, and A. T. A. D. Middlemass.

PREMIER COLLOID MILLS, LTD., Salisbury House, London Wall, E.C.—Registered June 24. Capital, £1,500 in £1 shares. Vendors and distributors of apparatus for the minute disintegration of substances; ironfounders, mechanical engineers, manufacturers of chemical and other machinery, etc., acquiring the business carried on by F. J. E. China, and Burt Boulton and Haywood, Ltd., known as the Premier Mill Department of the said company. Directors: The Rt. Hon. Earl of Dunmore, G. E. H. Yonge, F. J. E. China, W. C. Forbes.

SAYES AND CO., LTD., Old Bank Chambers, Park Row, Leeds.—Registered June 23. Capital, £3,000 in £1 shares. Heating, consulting, chemical, steam engineers. Directors: J. Sayes, E. H. T. Green.

SIMPSON, THOMSON AND SHANNON, LTD., 140, Glenpark Street, Dennistoun, Glasgow.—Registered June 20. Capital, £6,000 in 1,000 preference and 5,000 ordinary shares of £1 each. Oil and colour merchants, chemists, druggists, drysalters, etc. Directors: J. Simpson, C. H. Thomson, G. M. Shannon, A. Crawford.

Fuel Economy Review

THE 1931 issue of *Fuel Economy Review*, which is published by The Federation of British Industries, 21, Tothill Street, Westminster, S.W.1 (price 2s. 6d.), in an attempt to disseminate information on all points concerned with efficient fuel utilisation, contains an editorial on "Efficiency in Theory and Practice," which is of particular topical interest during the present industrial depression, when the word "efficiency" has been "grossly misused for propaganda purposes in relation to industrial effluents by the assertion that Industry was wasting its profits through its chimneys or its outfalls." Other contributions include:—"The Composition of Coal," by F. Sinnatt; "The Sampling of Small Coal," by E. S. Grumell and A. C. Dunningham; "Low Temperature Carbonisation," by C. H. Lander; "A Review of Coke Oven Technology During the Year, 1930," by G. E. Foxwell; "Gas Works Practice in 1930," by Gilbert B. Howarth; "Modern Gas Producer Practice," by H. C. Armstrong; "Industrial Uses of Town's Gas," by C. M. Walter; "Conservation of Heat in the Annealing of Glass," by T. C. Moorshead and E. A. Coad-Pryor; "Industrial Furnaces," by John Fallon; "Recent Researches into Blast Furnaces Phenomena," by M. A. Vernon; "The Quality and Fuel Consumption Factors in Smelting and Remelting Processes," by J. E. Fletcher; "Routine Tests for the Control of Water Softening Plant," by L. O. Newton; "Industrial Thermal Efficiency," by E. G. Phillips; "Internal Combustion Engines for Industrial Power Purposes," by F. W. Burstall; "Ironless Induction Furnaces," by Sir Robert Hadfield and R. J. Sarjant; "Electricity in Industry," by D. J. Bolton; and "Experiments on the Measurement of Smoke Under Industrial Conditions," by W. A. Wordley.

The Distillers Co. Dividend

A FINAL dividend of 12½ per cent., making 20 per cent. for the year ended May 15, is announced by the Distillers Co. This rate has now been maintained for the sixth successive year. While this great undertaking cannot have escaped some of the effects of unfavourable world conditions, the upholding of its dividend is not a matter of surprise in view of the fact that the company for years past has shown a considerable margin of profit over dividend requirements. Moreover the dividends of some of its principal associated companies have already been announced at rates similar to those of the preceding year. The directors are again placing £500,000 to reserve, but of that amount one half goes to a reserve for equalisation of dividends. The starting of a reserve of this character follows the building up of the general reserve to a total (including the present allocation) of £2,500,000. The balance carried forward is raised from £269,635 to £283,151. The Distillers Co., through its associated company, British Industrial Solvents, Ltd., now ranks as one of the most important units in the industrial chemical industry.

Tariff Changes

GERMANY.—According to an Order issued by the Ministry of Finance on June 5, the duty on the following mineral oils imported into Germany has been increased from 10 to 17 Reichsmarks per 100 kilogs., with effect from May 29: (*a*) Petroleum, liquid natural mineral tar, lignite tar oil, peat oil, schist oil, boghead or cannel coal tar oils, and other mineral oils not specially mentioned in the Tariff, crude or refined (except lubricating oil, resin oil and pitchlike residues from the distillation of mineral oils, containing paraffin and of a tarry nature and not sinking in water) *ex* Tariff No. 239; (*b*) light coal tar oils, including oily distillates from coal tar oils—*e.g.*, benzol, cumol, toluol, xylol; also asphalt, naphtha and hydrocarbon (Kohlenwasserstoff) *ex* Tariff No. 245.

ITALY.—The *Gazzetta Ufficiale* (Rome) for June 17 contains a Royal Decree-Law dated June 1 and effective on June 18, which increases the Customs duties under the General Tariff on lead and its alloys (in which the lead content is greater by weight than that of any of the other metals constituting the alloy) in the form of pigs and scrap, from 11 to 22 paper lire per 100 kilos. The duty on oxide of lead is increased from 29·40 to 41 paper lire per 100 kilos; carbonate of lead from 29·40 to 38 paper lire per 100 kilos; and acetate of lead from 44 to 50·40 paper lire per 100 kilos.

IRAQ.—The Iraq Government *Gazette* (No. 21) of May 17 contains particulars of a Law (No. 45 of 1931) revising the duties on oils and oil products imported into, or produced in, Iraq. These revised Customs import duties are as follows:—(*a*) On motor spirit—*i.e.*, all inflammable liquids or mixtures of liquids capable of being used as fuel for internal combustion engines, other than articles enumerated in 2 and 3 below—6½ annas per imperial gallon. (Formerly 4 annas per imperial gallon); (*b*) on kerosene oil of specific gravity not less than 0·780 at a temperature of 60° F., or solar oil, mineral sperm oil and any other heavy mineral oil having a flash point not below 100° F. by Abel's close test, but not including lubricating oils, vegetable and animal oils and fuel oil—½ anna per imperial gallon. (Formerly ½ anna per imperial gallon when imported in bulk and 2 annas per imperial gallon when imported in cases, tins or drums); (*c*) on denatured spirit (such as methylated spirit) rendered permanently and effectually unfit for drinking—12 annas per imperial gallon, plus an additional duty of 15 per cent. *ad val.*

Chemical Trade Inquiries

These inquiries, abstracted from the "Board of Trade Journal," have been received at the Department of Overseas Trade (Development and Intelligence), 35, Old Queen Street, London, S.W.1. British firms may obtain the names and addresses of the inquirers by applying to the Department (quoting the reference number and country), except where otherwise stated.

GERMANY.—An agent in Opladen (Rheinprovinz) desires to secure the representation of British manufacturers of fine chemicals (bismuth salts, bromides and potassium and sodium compounds, etc.). (Ref. No. 17.)

DOMINICAN REPUBLIC.—A firm at Puerta Plata desires to represent British manufacturers or exporters of Soya bean oil; materials for the manufacture of soap, for example, tallow, caustic soda, and Ceylon coconut oil. (Ref. No. 24.)

Decrease in German Steel Production

SEMI-FINISHED steel products delivered by the German Associated Steel Works in the first four months of this year totalled 251,370 metric tons, 91,784 metric tons less than in the corresponding four months of 1930. Of the total, 173,501 metric tons went to the foreign market.

Deliveries of superstructure steel in the same period totalled 354,581 metric tons, 96,127 metric tons less than in the corresponding period of last year, 70,003 metric tons being placed on the foreign market.

Chilean Nitrate Prices

ACCORDING to a circular issued by the Chilean Nitrate Producers' Association (London), Ltd., the prices and conditions of sale for Chilean nitrate of soda in Great Britain for delivery during July will be the same as those for June. The prices of six-ton lots, carriage paid to consumer's station, are £10 2s. 6d. per ton for granulated quality 98·99 per cent., and £10 per ton for ordinary quality basis 95 per cent.